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FM 1-100

DEPARTMENT OF THE ARMY FIELD MANUAL

ARMY AVIATION



**HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1963**

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ARMY AVIATION

CHANGE }
No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 30 June 1964

FM 1-100, 5 June 1963, is changed as follows:

Make the following pen-and-ink changes throughout the manual.

Substitute **aviation air traffic control company (AATCC)** for "Army air traffic regulation and identification (AATRI)."

Substitute **direct support maintenance** for "third echelon maintenance."

Substitute **general support maintenance** for "fourth echelon maintenance."

In the title of paragraph 56, complete the word "Forward."

23. Air Messenger and Courier

* * * *

c. Air Courier Procedures.

- (1) (Superseded) Air courier service differs from aircraft messenger in that air couriers are officers by whom highly classified material can be transmitted in clear text. This service provides a rapid and safe means for circulating administrative information and materials throughout a wide-spread theater of operations. It relieves electrical signal communications of a large portion of nontactical, low-precedence traffic which can be transmitted efficiently by air courier.

* * * *

58. Supporting Aeromedical Evacuation Means

* * * *

c. Army air movement * * * the evacuation system. Evacuation movements of opportunity are instituted by the medical officer in the for-

ward facility when a requirement arises coincident with the availability of a nonscheduled aircraft which is to move to the general destination area predesignated by the supporting surgeon for these patients. In this instance, * * * the destination airfield.

* * * *

69. Planning Employment

* * * *

c. *Planning Sequence.* The procedures for * * * are as follows:

* * * *

70. Employment of Fixed and Rotary Wing Aircraft

* * * *

b. (Superseded) *Escort.* Escort aircraft are used to provide armed escort and automatic weapons type base of fire. When suitably armed, they are used as highly mobile antitank weapons.

* * * *

84. General

The aerial mobility provided by Army aviation affords the ground command the increased flexibility needed to **conduct CBR operations under varying conditions.** CBR materiel * * * of Army aircraft.

94. Army Aircraft Armament (Superseded)

The Army has several types of armed helicopters with a limited fire support capability. Army helicopters may provide cover for aircraft with the same or slower speeds for the duration of flights or provide protection for

faster aircraft for short periods of time. Armed helicopters provide support for use against ground elements. The mission of maintaining air superiority is the responsibility of the Air Force.

113. Orders and Instructions

a. (Superseded) Signal Operation Instructions (SOI) are combat orders issued by major commands for the technical coordination of communications within a command. SOI include items subject to frequent change such as authentication systems, operations and map codes, radio call signs and frequencies, teletypewriter call signs, and visual and sound signals.

* * * * *

115. Ground-to-Ground Communications

a. *Wire.*

* * * * *

(2) Wire communications between the aviation unit flight operations section and the flight coordination center (FCC) is provided by the area communication system.

(3) The area communications system will provide circuits from the FCC through the corps flight operations center (FOC) to the Army FOC.

* * * * *

124. General

Army air traffic * * * all flight conditions. The Army aviation air traffic control company (AATCC) will provide en route IFR air traffic regulation, navigational aids, air warnings, and other assistance to in-flight aircraft. In addition, it * * * the required liaison.

174. Supply Economy

* * * * *

d. (Superseded) Consolidation of Equipment Deadlined for Parts (EDP). Policies pertaining

to the use of serviceable parts from unserviceable aircraft or aircraft components, established in AR 750-1500-8, will be closely followed.

e. (Added) *Cannibalization.* Cannibalization of aircraft is allowed only as prescribed in AR 750-50.

175. Maintenance Categories

(Superseded)

Maintenance operations are classified by categories according to the equipment and technical skills required (AR 750-1). The categories of maintenance are:

a. *Organizational Maintenance.* Organizational maintenance is that maintenance normally authorized for, performed by, and the responsibility of a using organization on equipment in its possession. (This function was formerly known as first and second echelon maintenance.)

b. *Direct Support Maintenance.* Direct support maintenance is that maintenance normally authorized and performed by designated maintenance activities in direct support of using organizations. (This function was formerly known as third echelon maintenance.)

c. *General Support Maintenance.* General support maintenance is that maintenance authorized and performed by designated TOE and TD organizations in support of the Army supply system. (This function was formerly known as fourth echelon maintenance.)

d. *Depot Maintenance.* Depot maintenance activities, through overhaul of economically repairable materiel, augment the procurement program in satisfying overall Army requirements and, when required, provide for repair of materiel beyond the capability of general support maintenance organizations. (This function was formerly known as fifth echelon maintenance.)

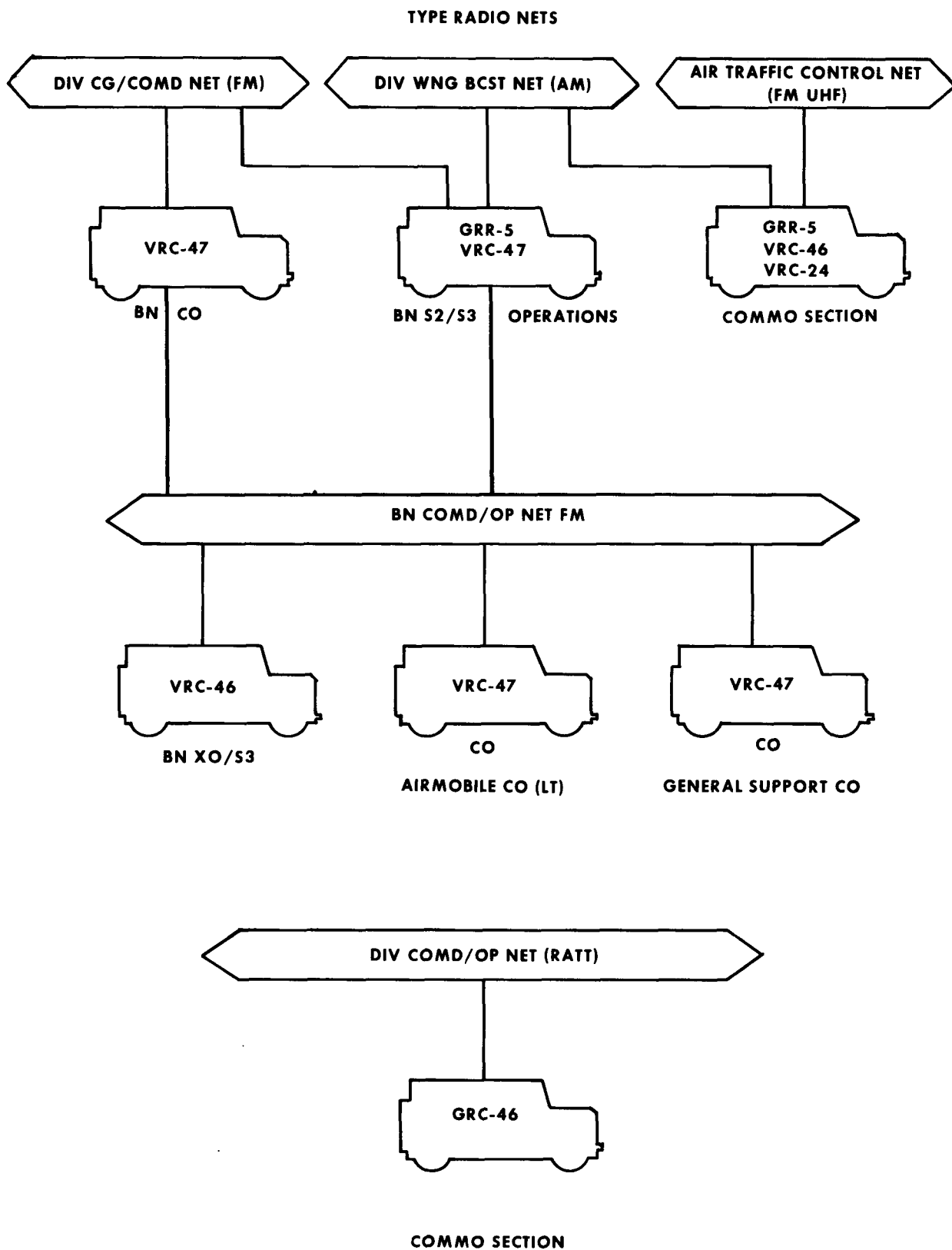


Figure 17. (Superseded) Type radio net, Aviation Battalion (ROAD DIVISION).

TYPE RADIO NETS

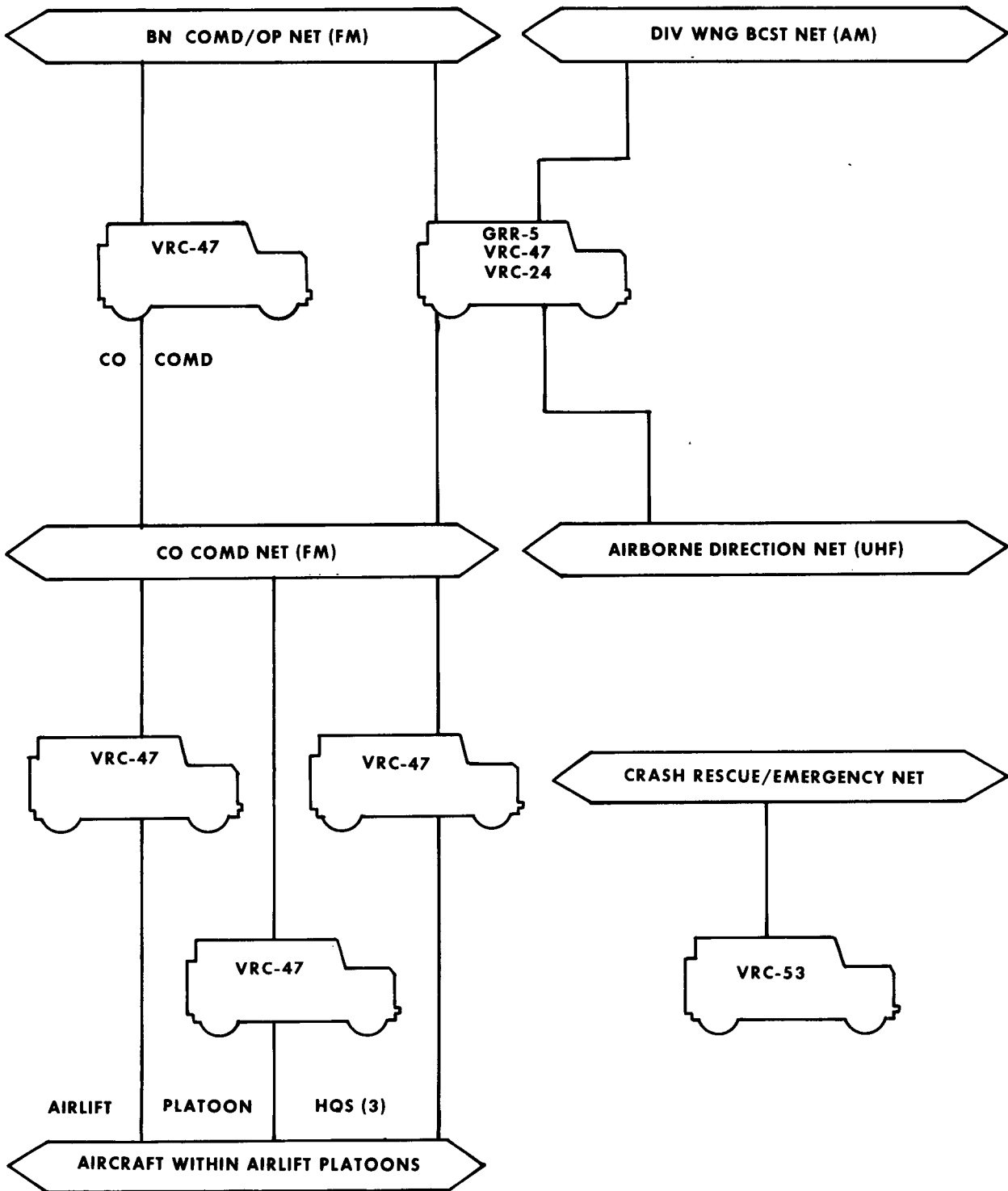


Figure 17.1 (Added) Type radio net, Airmobile Company Light (ROAD AVN BN).

TYPE RADIO NETS

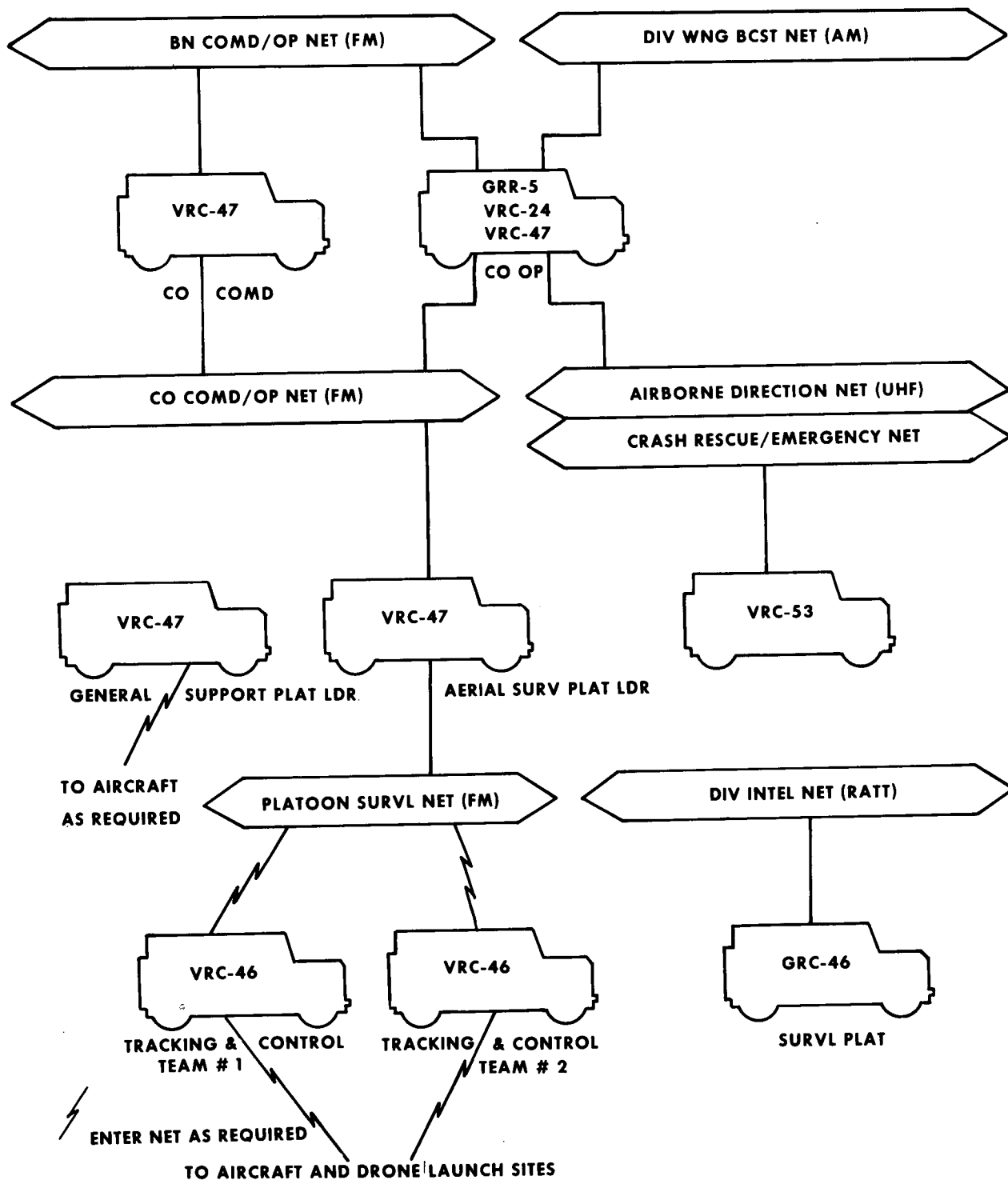


Figure 17.2 (Added) Type radio net, general support company.

APPENDIX VIII. PREACCIDENT PLAN (MODEL)

* * * * *

Annex E (Duties and Responsibilities of the Aircraft Maintenance Officer) to the Preaccident Plan

* * * * *

2. The Aircraft Maintenance Officer will be responsible for—

* * * * *

g. Providing Airfield Operations with one 01-A and one utility helicopter daily.

By Order of the Secretary of the Army:

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

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 USACMLCSCH (15), USASWS (25)
USACAG (5)
USACSSG (5)
USAIAS (5)
USACDC Nuclear Gp (5)
USACDC SPWAR Gp (5)
USACDEC (5)
Units org under fol TOE:
 5-36 (1)
 5-52 (5)
 5-112 (1)
 5-116 (1)
 5-346 (1)
 5-348 (1)
 6-101 (1)
 6-201 (1)
 6-301 (1)
 6-401 (1)
 6-406 (1)
 6-416 (1)
 6-426 (1)
 6-501 (1)
 6-536 (1)
 6-576 (1)
 7-2 (5)
 7-42 (5)
 7-52 (5)
 7-102 (5)
 8-137 (5)
 8-500 (RA) (5)
 10-201 (1)
 10-202 (1)
 10-206 (1)
 11-67 (1)
 11-68 (1)

11-96 (1)
 11-117 (1)
 11-500 (UA, UB) (1)
 17-2 (5)
 17-4 (5)
 17-22 (5)
 17-26 (1)
 17-42 (5)
 17-52 (1)
 17-85 (5)
 17-102 (1)
 17-106 (1)
 17-108 (1)
 17-136 (1)
 17-408 (5)
 29-2 (1)
 29-6 (1)
 29-15 (1)
 29-25 (1)
 29-35 (1)
 30-6 (1)
 30-16 (1)
 30-17 (1)
 30-18 (1)
 30-26 (1)
 30-29 (1)

37-4 (5)
 37-42 (5)
 37-102 (5)
 39-52 (5)
 39-62 (5)
 44-2 (1)
 44-12 (1)
 44-102 (1)
 44-112 (1)
 51-2 (5)
 55-56 (1)
 55-57 (5)
 55-79 (1)
 55-89 (1)
 55-99 (1)
 55-456 (1)
 55-457 (1)
 55-458 (1)
 55-468 (1)
 55-469 (1)
 55-500 (KA, KB) (1)
 57-4 (5)
 57-6 (5)
 57-42 (5)
 57-102 (5)

NG: State AG (3); Units—same as Active Army except allowance is one copy to each unit.

USAR: Units—same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320-50.

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FIELD MANUAL }
No. 1-100 }

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DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 5 June 1963

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PART ONE
INTRODUCTION
CHAPTER 1
PURPOSE AND SCOPE

1. Purpose

This manual is a guide for commanders, staff officers, Army aviators, and other Army personnel concerned with the operational capabilities, training, and tactical employment of Army aviation.

2. Scope

a. This manual is broad in scope and applies to all Army aviation units regardless of the mission or type of aircraft assigned. It covers missions, methods of employment, operations, and the various service and support functions required by Army aviation. "Army aviation" refers to the aviation personnel, aircraft, and allied equipment organic to a unit. An "Army aviation unit" is an organization comprised predominantly of aviation personnel and aircraft whose purpose is to provide aviation support to units with little or no organic aviation and with no habitual day-to-day need for this support.

b. Technical data are limited to essentials. Complete technical and administrative data are contained in other official publications cross-referenced in the text and listed in appendix I. Additional appendixes in this text cover particular formats and procedures that are useful in expediting or fulfilling aviation requirements.

c. The material presented herein is applicable to nuclear or nonnuclear warfare.

d. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded directly to the Commanding Officer, United States Army Combat Developments Command, Aviation Agency, Fort Rucker, Ala.

CHAPTER 2

MISSION AND GENERAL CHARACTERISTICS OF ARMY AVIATION

3. Mission

The mission of Army aviation is to augment the capability of the Army to conduct prompt and sustained combat incident to operations on land.

4. General Characteristics

Army aviation is integrated into combat, combat support, and combat service support units of the Army when the employment of Army aircraft will benefit Army operations. It is used by the commander as he sees fit in the accomplishment of his missions.

a. Capabilities. The capabilities of Army aviation include the ability to—

- (1) Provide a means of achieving greater mobility for supported forces by moving personnel and equipment with greater speed, virtually unaffected by terrain obstacles.
- (2) Provide a means of rapidly shifting, redirecting or massing forces as necessary.
- (3) Provide a means for rapid and effective reconnaissance and surveillance of large areas, target acquisition, and observation of fire.

- (4) Deliver aerial fire support.
- (5) Provide airlift for movement of patients.
- (6) Provide an expeditious means for commanders to exercise control by personal contact, liaison, and augmentation of communications.
- (7) Operate under marginal weather conditions.

b. Limitations. The limitations of Army aviation include—

- (1) Vulnerability to enemy air defense measures.
- (2) Requirements for a large amount of POL.
- (3) Continuous necessity for maintenance and parts supply.
- (4) Varying load-carrying capability, dependent upon the condition of individual aircraft, altitude, distance, and weather.
- (5) Adverse effect of severe weather.
- (6) Limited lift capacity of a unit's heavy equipment.
- (7) Restriction of visibility at night.

CHAPTER 3

COMMAND AND STAFF

Section I. COMMAND AND SPECIAL STAFF RESPONSIBILITIES AND RELATIONSHIPS

5. General

Organic or attached Army aviation units provide the tactical commander with combat support and combat service support. Maximum use of these units can be accomplished when the tactical commander understands aviation capabilities, limitations, and employment techniques and has established definite command and operational control policies for their inclusion in the operational plan. The methods of employing supporting units provide a wide range of selection in the degree of control and responsibilities given the supported commander. The primary consideration should always be the degree of control necessary, the logistical burden being of secondary importance. The commander should encourage close liaison between Army aviation units and supported units.

6. Command Responsibilities and Relationships

a. Army aviation is a member of the tactical and logistical team employed by the tactical commander to accomplish his missions. The relationship between the aviation commander and the supported unit commander depends upon the assignment of the aviation unit. When the unit does not have an Army aviation special staff officer, the aviation unit commander will assume these duties. In all cases, close coordination and liaison between commanders and staffs is essential to accomplishing the mission. Aviation units are assigned or attached to, or are under operational control or in support of, a unit. For other than fire support units, the terms "support" and "direct support" are synonymous and are equally acceptable for, use in writing orders.

- (1) *Attachment.* Attaching one unit to another gives the gaining commander maximum control of the supporting

unit, but it also imposes upon him an increased logistical and administrative burden. In most instances, attachment below brigade level for extended periods adds a prohibitive burden. Battalion-size units normally do not have the capability to support aviation units logistically; also, the small staffs at this level do not have the personnel to devote to the detailed planning and coordination necessary to employ larger aviation units in airmobile-type operations. Armor missions or deep penetrations, exploitation, and pursuit may require that divisional aviation be attached at battalion level. Such operations may prevent the parent aviation unit from furnishing adequate support because of distances involved and speed of the operation. If the degree of control afforded by attachment is necessary, but relief of the supported commander in planning and logistical tasks is desired, provision for necessary logistical assistance can be made in the operations order, with attachment to become effective at a prescribed time and date after completion of the planning phase.

- (2) *Operational control.* Normally, non-divisional aviation is employed under the operational control of units below division level, with control becoming effective at the beginning of the execution phase of the operation. This relieves subordinate commanders and staffs from time-consuming planning and coordination, logistical burdens, and administrative problems. However, it gives them the necessary authority to direct operations. Subordi-

nate commanders may not assume a greater degree of control than has been delegated by a senior headquarters. This technique provides for the transfer of control at the latest possible time consistent with successful accomplishment of the mission.

(3) *Support.*

(a) *Direct support.* Direct support provides for a direct mission request channel between units involved, with the supporting element retaining full latitude as to how the requested missions will be accomplished. Command, logistical, and administrative responsibilities remain with the parent unit or a higher headquarters. The degree of success of this relationship will depend largely upon coordination and cooperation between affected units.

(b) *General support.* General support vests control of the unit with the parent unit. Priorities for support are established when requests exceed the capabilities of the supporting unit. The commanders involved must rely on mutual cooperation for complete success under this relationship. Logistical and administrative requirements remain with the parent unit or a higher headquarters which has been given these additional responsibilities by virtue of attachment or operational control.

b. In corps and higher echelons, including augmented logistical commands, the aviation officer is a special staff officer. Normally, he is not a commander. Commanders of aviation units assigned or attached to higher echelons have the same status as commanders of similar support units. When given a specific support mission, their relationship is as discussed in *a* above.

c. There is no direct chain of aviation command from army to corps, from corps to division, or from the division to aviation organic to units within the division.

d. When directed by his commander, the Army aviation special staff officer may assume operational control of aviation units under control of the command.

7. Special Staff Responsibilities and Relationships

a. Aviation special staff responsibilities and relationships are parallel in many respects at division, corps, and army levels; the scope of the operations, however, increases at the higher echelons.

b. The aviation officer of a force has staff responsibility for all Army aviation with the force. He advises the commander on the employment of Army aviation and provides staff assistance and technical advice to all users.

c. The transportation officer determines requirements for—and plans, coordinates, and supervises the employment of—Army aviation allocated to combat service support operations and administrative air movements.

d. Allocation of Army aviation is shown in the force operation order. Coordination is developed between the supported commander and the aviation commander.

e. In addition to the duties described in FM 101-5, responsibilities that apply generally to all include—

- (1) Determining the requirements for, and recommending the allocation of, Army aviation support. This includes requirements for units and materiel to replace or augment unit aviation.
- (2) Recommending assignment of Army aviation personnel and estimating personnel requirements for organic aviation units.

Section II. CONTROL AND COORDINATION

8. General

The efficiency of Army aviation employment depends on adequate control of aviation and coordination with the supported units. Control

and coordination are accomplished by effective communications, appropriate location of command post, timely estimates of the situation, adequate plans and standing operating procedures, and effective liaison.

9. Communications

The communications systems of aviation units are designed to afford the aviation commander the means for controlling and coordinating his unit. All plans involving the use of Army aviation must contain detailed instructions on communications to include the employment of all available means to transmit orders, information, and intelligence between aviation units and supported units. The commander of each aviation echelon is responsible for the installation, operation, and maintenance of the communications facilities of his command. The communications officer of each aviation unit exercises immediate staff supervision over the unit's communications facilities. Details of aviation communications and duties of the communications officer are discussed in chapter 14.

10. Command Post

The command post of an Army aviation unit is located where it can best be used to exercise control of subordinate elements. Tactical considerations in locating the command post are concealment, dispersion, reliable communications, and access routes.

11. Estimate of the Situation, Plans, Orders, and Standing Operating Procedures

Aviation commanders and special staff officers must plan and recommend the allocation and employment of Army aviation. The aviation commander's estimate of the situation and his plan to provide the best possible support must be continuous. For smooth-functioning

aviation support, standing operating procedures must be prepared, tested, and constantly revised. The approved plans are incorporated into the order issued for the employment of the force. With each change in the situation, the Army aviation commander and/or the aviation special staff officer must reexamine all considerations involved and decide whether or not changes in the aviation support are required. This is a continuous process carried out concurrently at all echelons in close coordination with the supported unit commander and his staff. A discussion of the techniques involved in the preparation of estimates of the situation, plans, orders, and standing operating procedures is contained in FM 101-5. An example aviation annex to the division operations order is given in appendix III. An example aviation annex to division SOP is presented in appendix IV.

12. Liaison

a. Command. Aviation commanders accomplish liaison with supported commanders through personal contact. A liaison officer, acting as the commander's personal representative to the supported unit, maintains continuous liaison during each mission. See FM 101-5 for principal duties of liaison officers.

b. Staff. Liaison between staff sections of one unit and the same or similar staff sections of an associated unit is desirable for further cooperation and coordination between units. In accomplishing staff liaison, staff officers act only within the policy limits set by the commander.

Section III. ESTIMATE OF ARMY AVIATION REQUIREMENTS

13. General

FM 101-10, part I, contains tables showing aircraft capabilities, planning factors (to include flying hours), maintenance requirements, availability of aircraft, and loading and unloading time. These are helpful in initial planning. As the operation progresses, more accurate experience data applicable to the conditions encountered should be compiled to be used as a guide for planning future operations.

14. Responsibility

a. The aviation special staff officer of an echelon ordering or conducting an operation is

responsible for making the estimate of the aviation requirements. He considers the eventual organization for combat and type of mission assigned. Lower echelon and other aviation commanders may assist in the preparation of the estimate.

b. Army aviation estimates are made to determine the number and types of aviation units or aircraft (including aviation maintenance) required to support the contemplated operation, and the allocation of units or aircraft needed at lower echelons. For example, when the G4 requests an estimate of aviation POL require-

ments, this information will be supplied by the aviation staff in coordination with the units concerned.

15. Basis of Aviation Estimate

a. The requirements for Army aviation support may include aircraft to provide—

- (1) Aerial observation, target acquisition, and survey operations.
- (2) Airlift of troops.
- (3) Offensive aerial fire support.
- (4) Aerial delivery of equipment and supplies.
- (5) Airlift and support for rear area security and area damage control.
- (6) Airlift for command and control.
- (7) Augmentation of communications.
- (8) Airlift for movement of patients.

b. The amount and type of aviation required for an offensive action depend primarily on the plan of the commander. This permits prompt and effective employment of aviation in the area where decisive offensive action is contemplated. Generally, units making secondary efforts will be allocated limited amounts of aviation support.

c. The amount and type of aviation required for a defensive action depends primarily on the

capabilities of the enemy, the nature of the terrain, and plans of the commander. Normally more aviation will be required for observation, movement of reserves, and airlift of supplies than for other types of defensive action.

16. Factors Affecting Estimates

Factors that must be considered in estimating the number and type of aviation units and aircraft and the amount of backup support required are—

- a.* Tentative plan of operation.
- b.* Type of operation (attack, defense, delaying, special, etc.).
- c.* Weather and terrain.
- d.* Composition, tactics, disposition, and organization of enemy forces, including degree of effectiveness of enemy air defense means.
- e.* Availability and known or expected use of aircraft.
- f.* Availability and known or expected use of nuclear weapons.
- g.* Comparative strength of friendly and enemy forces to include morale, training, and supply, with emphasis on air defense capability.
- h.* Allowances for losses during combat.

PART TWO
MISSION CAPABILITIES
CHAPTER 4
COMMAND, CONTROL, AND COMMUNICATIONS

Section I. COMMAND

17. General

The effects of modern weapons dictate wide dispersion of military forces. This dispersion makes control of, and communication between, units more difficult and magnifies the need for immediately effective command control and liaison. Army aviation provides the commander with a rapid means of exercising personal control, achieving effective liaison, and augmenting existing communications. The choice of aircraft for command, control, and communications functions varies with conditions. The following rules serve as a guide:

a. Fixed wing aircraft should be used when—

- (1) Relatively long distances are involved.
- (2) Adequate landing areas are available.

b. Rotary wing aircraft should be used when—

- (1) Distance is relatively short.
- (2) Adequate landing areas are not available.
- (3) A wide range of airspeeds is desired.

(4) Visibility is limited and/or low ceilings exist.

c. When instrument flight is necessary, landing areas are limited to those which have approach facilities. Aircraft using them must have adequate instrumentation. For specific details, see FM 1-60.

18. Command, Staff, and Liaison

The use of Army aircraft enables commanders and staff officers to—

a. Make timely and frequent personal visits to subordinate units.

b. Observe the progress of an operation from an aerial vantage point.

c. Move rapidly to critical areas.

d. Make rapid and continuous reconnaissance.

e. More rapidly assemble commanders and staffs from widely separated locations.

f. Expedite coordination between units engaged in combat, combat support, combat service support, joint operations, and other actions requiring direct contact.

Section II. CONTROL

19. General

a. The commander is seldom able to exercise the degree of control he desires during administrative or tactical operations. This is particularly true in tactical movements in which control is complicated and must be carefully supervised. Army aviation provides the commander with a flexible means to achieve radio or visual

contact with elements under his command, thus increasing the effectiveness of both administrative and tactical control.

b. A primary requisite for aerial control of a movement is the ability to identify the particular unit command post or key vehicle from the air. Markings will be governed by unit SOP. Use of panels, pyrotechnics, and other devices



Figure 1. Aerial command post.

for day and night identification will normally be included in unit SOI's.

c. *Radio communication* is the normal means of contact between the commander's aerial vehicle and his ground unit. However, extensive use may be made of message drop and pickup and visual signals during periods when radio silence is imposed.

20. Administrative

a. *Movement Control.* Army aviation has the capability of performing continuous reconnaissance in advance of a marching unit, which permits early detection of obstacles and impassable areas. March discipline can be monitored and lost units located and expeditiously directed. Specialized maintenance personnel and spare parts necessary to repair disabled vehicles may be delivered by Army aircraft.

b. *Straggler Control.* Army aircraft may be used to observe routes of communication and relay information to ground units concerning stragglers. Aircraft may also pick up stragglers, deliver them to the processing point, or return them to their units.

c. *Refugee Control.* Another mission of Army aviation is the dissemination of information (via leaflet drop or loudspeakers) to refugees concerning routes of communication and collection points. Refugees may also be moved or supplied by Army aircraft.

d. *Traffic Control.* Army aircraft provide an efficient means of patrolling routes of communication and locating traffic tieups and obstacles. Difficulties can be quickly spotted and means to correct them initiated. (Aircraft are particu-

larly adapted to accomplishing these missions in rear areas.)

e. *Riot Control.* Army aircraft are adaptable to riot control missions in which they are useful in spotting trouble areas and directing ground personnel from an aerial vantage point. To perform this type mission, careful planning and coordination must be accomplished to insure adequate communications and proper use of special equipment.

- (1) Directives and ultimatums to rioting groups may be disseminated through loudspeakers. Loudspeakers are available which are specifically designed for use by attachment to aircraft, while others designed for ground vehicles may be modified for use in Army aircraft.
- (2) Riot control agents to disperse rioting groups can be delivered from Army helicopters. Riot control agent dispersers are available for use on helicopters but must be requested through Chemical Corps supply channels.

21. Tactical

Commanders may incorporate Army aircraft as an additional means of control for coordinated ground attacks upon an objective by directing operations from a helicopter equipped as a command post (fig. 1). Aerial observation of the overall progress of the attack affords reliable information on which to base decisions to shift or lift supporting fires. Enemy strong-points and reserves can be spotted and effectively countered.

Section III. COMMUNICATIONS

22. General

Army aviation provides the commander with additional means of augmenting normal ground communications. This makes command control more flexible, even with the increased dispersion of today's battlefield. Communication is possible during radio silence by message drop and pickup, visual signals, and air messenger/courier service. Radio communications can be extended by air radio relay, and ground relay stations can be transported by aircraft to other-

wise inaccessible areas and supplied. Wire can be laid expeditiously over areas which are impassable or extremely difficult to negotiate by surface means. The commander may also influence the situation by using aircraft to disseminate propaganda. Warnings may be issued to friendly troops and civilians in emergency situations.

23. Air Messenger and Courier

a. *General.* Air messenger or courier service provides a means of communications within and

between units. This service is used extensively in transmitting messages or material requiring physical distribution or delivery and is particularly applicable over large areas between widely separated locations where accessibility by surface transportation is difficult or impossible. Air messenger or courier service can be made available to all units. If an Army aircraft being used for messenger and courier service is forced down, precautions must be taken to preclude the information carried from reaching the enemy. Generally, material of intelligence value should not be carried by Army aircraft scheduled to fly over enemy territory. Aviators on missions to units whose areas may be under enemy observation must guard against revealing the location of the airfields. Aviators should be thoroughly familiar with landing and takeoff procedures of the airfield and should, if necessary, prearrange landing instructions with the aviation officer of the unit concerned.

b. Aircraft Messenger Operations. Messages may be given to an aviator, a passenger-messenger, or an observer prior to takeoff, or passed to an aircraft in flight by means of radio, pickup, panels, or other visual means. Messages may be delivered after landing, or from the aircraft in flight by radio, visual, or message drop means.

c. Air Courier Procedures.

(1) Air courier service differs from aircraft messenger service in that air couriers are commissioned officers by whom highly classified material can be transmitted in clear text. This service provides a rapid and safe means for circulating administrative information and materials throughout a widespread theater of operations. It relieves electrical signal communications of a large portion of nontactical, low-precedence traffic which can be transmitted efficiently by air courier.

(2) Courier operations are classed as *scheduled* or *nonscheduled*. Scheduled operations include delivery of periodic reports or overlays or distribution between message centers; nonscheduled operations include delivery of captured personnel, documents, or equipment on a nonscheduled basis.

(3) In echelons below theater level, air courier service is nonscheduled. The unit commander issues orders for the service and appoints the officer courier. The unit aviation officer provides the transportation. In many cases the aviator serves as the officer courier. Couriers are responsible to the unit commander for safe delivery of air courier materials.

(4) Air courier service procedure varies in different echelons and must be designed to meet local requirements. The procedure discussed below serves as a guide in echelons below theater level.

(a) Local instructions defining air courier material should be issued by the unit commander.

(b) Material for transmission by air courier should be examined by the responsible section to insure that it is correctly addressed, that its origin is clearly indicated, and that it is acceptable for delivery by air courier means.

(c) Messages should be sorted and listed in logical sequence according to their destination, and should then be registered and prepared for dispatch.

(d) A receipt for parcels and bags must be signed by the courier who assumes responsibility.

(e) At the destination, a receipt for such parcels and bags must be obtained from the designated addressee or authorized agent to relieve the courier of responsibility.

(f) When required, the air courier should submit a report of proper authority to give details of the trip and to point out any unusual occurrences.

24. Message Drop and Pickup

Message drop and pickup is adapted to supplement communications between aircraft and ground units in special situations such as periods of radio silence and other emergencies.

a. Message drop may be used as an alternate or emergency means of air-to-ground com-

munications to transmit information of immediate importance. Aircraft employed for this mission require a minimum of additional equipment. If necessary, message drop can be improvised and employed on very short notice.

b. The pickup of messages by aircraft in flight, like that of airdrop, can be employed on a scheduled or an unscheduled basis; but prearrangement is necessary to coordinate the operations between the aircraft and ground party.

25. Radio Relay

Radio relay is a primary means of extending the range of FM radios. This capability frequently cannot be fully exploited because of the limitations of ground transportation. Army aircraft may be used to overcome the limitations inherent in ground transportation. They provide a means for expeditious survey for radio relay sites and for airborne radio relay operations.

a. *Ground Radio Relay.* It is often desirable to install radio relay stations at points inaccessible to ground transportation. Examples are inaccessible locations in swamps, deserts, mountainous areas, etc. Installation may require island-hopping or the traversing of inadequate or congested roads. Aircraft can be used to transport personnel and equipment to selected sites to expedite the installation of important circuits. After the initial installation, aircraft may be used to supply operating personnel with rations, POL, and maintenance parts.

b. *Airborne Radio Relay.* Army aircraft may be used effectively as radio relay stations, especially in fast-moving situations. Special automatic retransmission units are available through signal channels for this purpose. Although new FM radio (ARC 54) designed for use in Army aircraft has the automatic retransmission capability, additional equipment will be required and should be available through signal channels. The use of the observer to relay messages will continue, and should be planned for, even when

the automatic capability exists. Radio retransmission should be covered in unit SSI's and SOI's.

26. Wire Laying

Army aircraft have the capability to lay wire across untenable areas of the battlefield or over difficult terrain which presents obstacles to conventional means of wire laying. Rotary wing aircraft are best suited for this mission because of their superior maneuverability, especially their ability to hover and land in confined areas. Aircraft laying wire are particularly vulnerable to ground fire because of their slow speed and lack of armor protection. They tend to draw fire and other hostile action when operating above critical combat areas. However, the use of Army aircraft for wire laying is justified when the terrain or tactical situation precludes conventional methods.

27. Propaganda Dissemination

Army aviation support of special warfare activities includes aerial distribution of leaflets and the use of loudspeaker systems to disseminate propaganda and information to frontline enemy troops and civil populations. Requests for propaganda or counterpropaganda activities are the responsibility of the G3. These missions should be carefully planned joint efforts of all concerned, with aviation special staff officers serving as advisors. For details on propaganda dissemination and other aviation special warfare activities, see chapter 11.

28. Warnings

Immediate danger warnings (CBR contamination or natural disaster) may be disseminated to isolated or disorganized units and civil populations having no other means of communication. The warnings can be disseminated by loudspeaker, sirens, pyrotechnics, or message drop. Plans and signals should be coordinated prior to operations and should be covered in unit SOP's.

CHAPTER 5

AIRLIFT OF PERSONNEL AND EQUIPMENT

Section I. AIRLIFT OF PERSONNEL IN THE COMBAT ZONE

29. General

a. An important function of Army aviation is the airlift of personnel, supplies, and equipment within the combat zone (figs. 2 and 3). This includes the movement of units to execute airmobile operations, the movement of reserves, the shifting and relocation of units and individuals within the combat zone, and the movement of units for rear area security and area damage control.

b. The requirements for Army aviation air transportation are generated by—

- (1) The need for attaining tactical advantage.
- (2) A need for speed and flexibility.
- (3) Dispersion of units on the nuclear battlefield.
- (4) Inadequate surface routes of communication as a result of—
 - (a) Enemy interdiction or severance of surface routes of communication.

(b) Terrain obstacles or restrictions which seriously limit the use of surface transportation.

(c) The advance of friendly forces exceeding the capability of surface transportation.

(d) The isolation of friendly forces.

c. Basic considerations for the use of air transportation are—

- (1) Availability of aircraft of suitable speed, range, and payload.
- (2) Facilities and terrain characteristics at rear airfields, intermediate landing points, and destinations.
- (3) Meteorological conditions.
- (4) Ability to maintain control of air routes of communication.
- (5) Availability of trained personnel to load, unload, and operate aircraft.
- (6) Adequacy of communications facilities.
- (7) Time available.



Figure 2. CV-2 Caribou loading troops.



Figure 3. CH-34 Choctaw unloading troops.

- (8) Enemy air defense capability.
- (9) Visibility conditions.
- (10) Availability, adequacy, and relative savings of time, men, and materiel as compared to the use of other means of transportation.

30. Staff Procedures, Coordination, and Planning

The unit requesting airlift of personnel is responsible for planning the movement and the necessary coordination with higher, lower, and adjacent units. The unit aviation officer or the supporting aviation unit liaison officer should assist in the movement planning. For detailed discussion of staff movement planning, see FM 57-35. Aircraft for airlift of personnel will normally be assigned on a mission basis with aviation unit integrity maintained as much as possible. Internal aviation planning to support the mission should be based on the plans of the supported unit. SOP's on air movement of troops should be developed at all levels by aviation units as well as supported units.

31. Airmobile Operations

An airmobile operation is one in which combat forces and their equipment are moved about the battlefield in aerial vehicles under the control of a ground force commander to engage in ground combat (fig. 4). The same principles apply to airmobile operations and to any airlift of troops and their equipment. For detailed discussion of airmobile operations, see FM 57-35.

32. Airborne Operations

Airborne operations involve the movement and delivery by air of combat and combat support elements into an objective area for execution of a tactical or strategic mission. Army aviation is capable of delivering a limited number of troops by airlanding or airdrop. Normally, Army aviation units will not deliver personnel or equipment (other than personnel or equipment of the aviation unit itself) into the airhead. Army aviation units organic to airborne elements are air transported into the airhead by Air Force aircraft or are flown in by



Figure 4. UH-1 Iroquois in airmobile operations.

Army aircraft when the distance permits. Army aircraft will be operated so as not to interfere with Air Force operations. Because

of the type missions involved, backup support (POL and spare parts) for several days of operation must be available.

Section II. AIRLIFT OF EQUIPMENT AND SUPPLIES IN THE COMBAT ZONE

33. General

Army aviation has the capability of moving equipment and supplies for any type operation (figs. 5 and 6) within the combat zone. Combat aviation units are authorized a limited number of aircraft to perform airlift missions. Airlift requirements beyond the capability of Army aircraft will require augmentation.

34. Staff Procedures

Requests for aerial delivery of supplies or equipment will be sent through normal channels. The decision to use Army aircraft for this type mission will be made by the echelon possessing the airlift capability (normally division or higher). Normal staff procedures are followed (par. 7). Coordination and planning will be accomplished at the level possessing supplies and aircraft to accomplish the mission. Logistical aviation units may be attached or assigned for this purpose. Aircraft of these units may be employed in combat support roles when the tactical situation requires; conversely, appropriate aircraft organic to combat support aviation units of a division may be allocated on a daily basis to S4/G4 for logistical support. The

appropriate S3/S4, G3/G4 will assign responsibilities for preparing and loading supplies or equipment into, or on, the aircraft. Quartermaster units at most levels possess the capability and equipment, and are responsible for the rigging of supplies and equipment for air-drop. Aviation units are authorized limited numbers of cargo slings and nets. Additional slings or nets will be required for sustained or large-scale cargo sling operations. When this requirement exists, additional slings should be procured through Transportation Corps supply channels and issued to the organization responsible for preparing the cargo for movement. The aircraft commander will check the packaging and supervise the loading of supplies and equipment. For details covering procedures, see FM 10-40, TM 10-500-6, and TM 55-406. Planning for this type movement will include—

- a. Delivery priorities to allow for differing load capabilities of individual aircraft and for weather conditions.
- b. Flight routes.
- c. Pickup and delivery points.

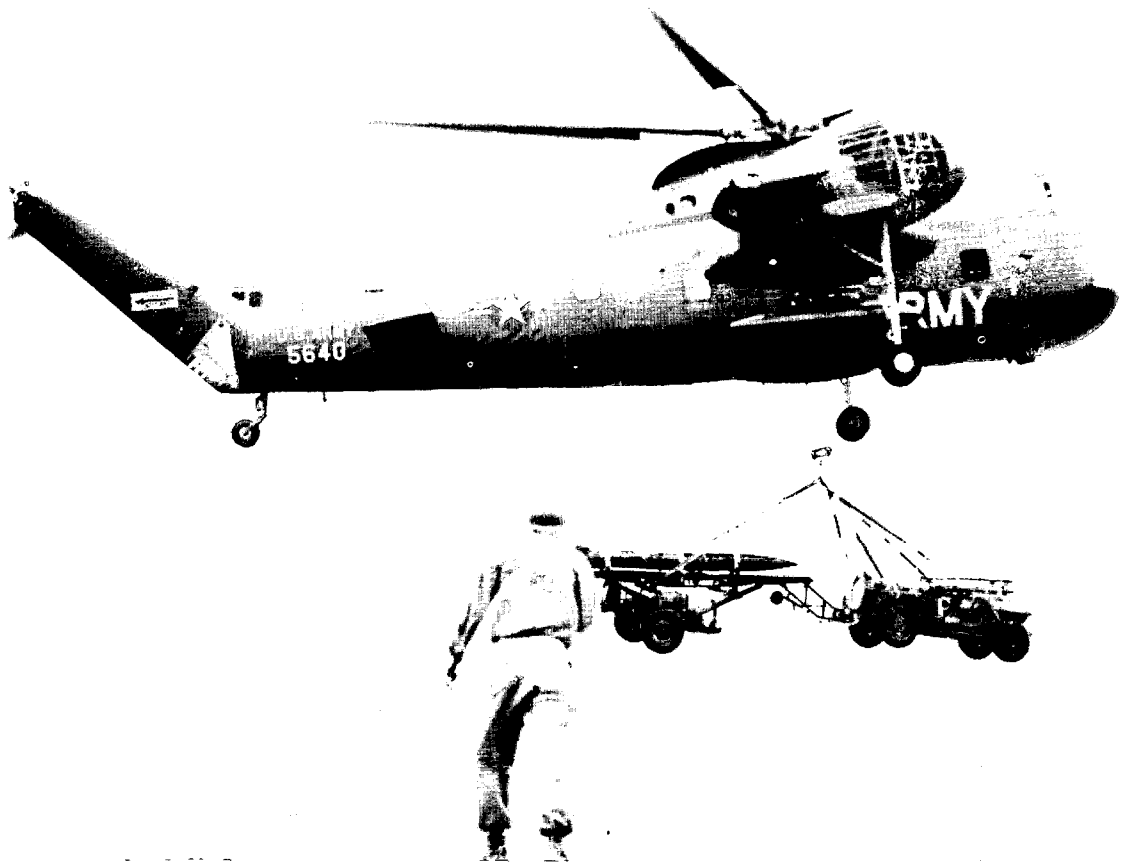


Figure 5. CH-37 Mojave transporting equipment.

d. Refueling when long distances are involved, or when limited fuel is carried because of the requirement for maximum payload.

e. Communications with, and identification of, units to receive supplies.

f. Methods of delivery (airlanded or air-dropped).

g. Establishment of landing or drop zones, where applicable. (The supported unit establishes these zones.)

h. Plans for use of unit pathfinders at landing or drop zones.

35. Airmobile Operations

In airmobile operations, the plan will include the requirement for delivery of equipment and

supplies. The supported unit will prepare and load its own equipment and supplies. Loading of the aircraft will be accomplished under the supervision of the aircraft commander. The resupply of this unit is handled as discussed in paragraph 34.

36. Joint Airborne Operations

Delivery to the airhead will be accomplished by Air Force elements until they are withdrawn from the operation. Supplies and equipment will be transported within the airhead by organic Army aviation in the same manner as discussed in paragraph 34.



Figure 6. CH-21 Shawnee transporting supplies.

Section III. REAR AREA SECURITY AND AREA DAMAGE CONTROL

37. General

The modern battlefield must be fluid to cope with the widespread destruction effects of nuclear weapons. Fluidity of the battlefield, however, increases the danger of enemy infiltration. Therefore, rear area security forces and area damage control parties are required. These elements must be flexible and highly mobile; they must possess necessary firepower and a highly efficient communications system. Army aviation's capabilities enable commanders to effectively control larger areas with a small force.

38. Requirements and Capabilities

a. Effective rear area security forces must—

(1) *Have a high degree of mobility.* Army

aviation can provide the required mobility to rear area security forces.

- (2) *Be flexible and capable of being tactically tailored to a wide variety of security missions.* Army aviation is capable of supporting a wide variety of missions. Army aviators are trained to work alone or as members of a team.
- (3) *Have adequate firepower to achieve superiority over expected hostile forces.* Army aviation has armed aircraft to provide fire support, or it can expeditiously transport additional firepower.
- (4) *Have adequate and efficient communications.* Army aviation's capability to provide radio relay stations, transport

communications facilities to inaccessible areas, lay wire, drop and pick up messages, and carry messengers and couriers increases the communications capacity of the supported force.

b. Effective area damage control parties must—

- (1) *Be capable of assuming control at the site of a major incident under a variety of conditions and making a rapid assessment of the situation.* The capability of Army aviation to provide aerial observation of the damaged area, make a rapid determination of the extent and intensity of radiological contamination by aerial monitoring and survey, patrol the area by air, transport control personnel into the area, and augment communications will greatly enhance the capability of the damage control party.
- (2) *Be capable of rapid expansion by augmentation from varied sources.* The rapid transport capability of Army aviation may be employed to bring in additional elements.
- (3) *Have a high degree of mobility.* Army aviation can provide mobility to the damage control parties as required.

39. Staff Procedures, Coordination, and Planning

a. The rear area security forces and the area damage control parties are normally controlled

by the operations center of the support command, or the logistical command. Army aviation for the support of this force will be allocated by the G3 as a secondary mission to be performed on an on-call basis. It may be necessary at times to give the supported force operational control of certain aviation elements over extended periods. The air cavalry troop is particularly well suited for rear area security and area damage control. An aviation liaison officer from the supporting unit should assist in planning for this mission. Detailed planning and decentralized execution are required, with aviation under operational control of the supported force. A specific aviation unit should be given the mission of supporting rear area security operations.

b. The necessary coordination must be accomplished with—

- (1) Higher, lower, and adjacent units.
- (2) Army air traffic regulation and identification (AATRI) companies.
- (3) Air defense elements.

c. Planning should include—

- (1) Pickup points for security or control parties.
- (2) Evacuation procedures.
- (3) Communications.
- (4) Support of forces to include ammunition, POL, and maintenance.
- (5) Acceptable nuclear radiation dosages.

CHAPTER 6

AIR MOBILITY FOR LAND RECONNAISSANCE

40. General

Land reconnaissance is performed by observers, unit reconnaissance organizations (the reconnaissance platoon in the infantry, armored, mechanized, and airborne battalions), patrols, and other units such as the armored cavalry squadron. Army aircraft may be used as aerial platforms for the single observer or may provide air transportation for reconnaissance elements. The use of Army aircraft increases the mobility and flexibility of reconnaissance elements and permits rapid commitment and withdrawal over long distances.

41. Missions

a. Aerial Observers. Aerial observers assist other information-collecting agencies by performing the following missions:

- (1) Target acquisition.
- (2) Observation and control of airstrikes, artillery, and smoke.
- (3) Damage assessment.
- (4) Radiological survey.
- (5) Route and area reconnaissance.
- (6) Location of units and installations.
- (7) Engineer reconnaissance.
- (8) Surveillance.

b. Air Cavalry Troop. The air cavalry troop is an organic combat troop of the divisional armored cavalry squadron and the armored cavalry regiment. This troop consists of a headquarters section, an aeroscout platoon, an aerorifle platoon, an aeroweapons section and a service platoon. Its primary mission is to extend and complement the reconnaissance and security capabilities of its parent unit. It uses air vehicles to provide armored cavalry units with an additional tactical mobility differential over that of the main battle force to insure adequate performance of its reconnaissance and security missions. For further information on the capa-

bilities, tactical employment, and organization of the air cavalry troop, see FM 17-36.

42. Air-Ground Unit Relationships

a. Aerial observer employment relationships are discussed in chapter 7.

b. The decision to provide airmobility to land reconnaissance elements is usually made at brigade or higher level. The intelligence officer (G2/S2) has staff responsibility for planning the details of the reconnaissance mission. He is assisted by the unit aviation officer, or liaison officer from the supporting aviation unit, the reconnaissance element commander, and other staff officers as necessary. He briefs and debriefs the reconnaissance element commander and aircraft commanders. He also coordinates the reconnaissance plan with those of higher, lower, adjacent, and supporting units as well as other units whose areas will be contacted or passed over by the reconnaissance element. The commander of the unit providing the air-transported reconnaissance element is responsible for the execution phase of the air-transported reconnaissance mission; the aircraft commander is responsible for the technical aspects of the flight. During flight, the reconnaissance element commander is kept informed of the aircraft's progress by the aircraft commander. If a change of flight route or landing site is desired, or an unexpected situation arises, the aircraft commander consults the reconnaissance element commander for instructions. When the reconnaissance element commander cannot be reached, the aircraft commander makes the decision based on his knowledge of the mission.

c. For air-ground relationships of the air cavalry troops, see FM 17-36.

43. Planning

a. Aerial Observers. Planning for aerial observer missions is discussed in chapter 7.

b. Air-Transported Unit Reconnaissance Organizations or Patrols.

- (1) The aerial delivery of reconnaissance elements into enemy-controlled areas depends upon—
 - (a) Availability of aircraft.
 - (b) Current enemy dispositions.
 - (c) Weather conditions.
 - (d) Fire support available.
- (2) Preparation of the mission plan begins as soon as possible, with the reconnaissance element leader and aircraft commander coordinating in the ground reconnaissance, flight, and landing plans. The ground reconnaissance plan is considered first as all other planning is based upon it. The intelligence officer coordinates planning with other principal staff officers. In planning reconnaissance missions, the following should be considered:
 - (a) Objectives.
 - (b) Covered routes of approach and return.
 - (c) The landing plan, including primary and alternate landing sites and parking sites (if required).
 - (d) The fire support plan, to include—
 1. Fire plans designed to weaken or demolish known or suspected enemy weapons.
 2. Smoke to deny enemy observation and interrupt enemy fire.

3. Fires to assist the aircraft during withdrawal.

4. Fire support agencies (e.g., forward observer, air control team, etc.) with the reconnaissance element.

- (e) Diversion of enemy fire by timing the reconnaissance element's flight through the forward area to coincide with actions that will divert his attention and cause him to disperse his fire. These actions include—

1. Placing other aircraft in the area, such as close air support, drone, and observation aircraft.

2. Conduct of ground attacks, demonstrations, feints, or similar operations by friendly ground troops.

- (f) The debarkation plan.

- (g) The rendezvous plan.

- (h) The withdrawal plan.

- (i) The camouflage plan.

- (j) Local security at the parking site (if required).

- (k) The communications plan.

- (l) Medical support plan.

- (m) Logistical support (if required).

- (3) For further details on aerial delivery of reconnaissance elements, see FM 57-35.

c. Air Cavalry Troop. For planning the employment of the air cavalry troop, see FM 17-36.

CHAPTER 7

AERIAL OBSERVATION AND SURVEY OPERATIONS

Section I. AERIAL OBSERVATION

44. General

Aerial observation capabilities of Army aviation are employed in surveillance, reconnaissance, target acquisition, observation of fire, camouflage inspection, survey operations, and in locating friendly units. Data obtained by Army aviation supplement data obtained by observation from the ground and by observation from long-range aircraft provided by the Air Force. Thus, the ground commander is provided with observation coverage of his areas of influence and interest.

45. Aerial Surveillance

Aerial surveillance involves the systematic and continuous observation of specific air, surface, or subsurface areas by visual, electronic, photographic, or other means employing an aircraft as the aerial platform. Factors influencing aerial surveillance are visibility, terrain, natural or manmade concealment, enemy air defense capabilities, crew competence, types of surveillance equipment, and aircraft radii of action. Aerial surveillance missions provide the supported commander with current information by keeping a systematic watch over his areas of influence and interest for the purpose of detecting, identifying, locating, and reporting information of military value.

a. Visual. Visual aerial surveillance is accomplished by employing direct (visual) aerial observation techniques to obtain and report information of military value. These techniques are divided into four areas: visual search, target recognition, geographical orientation, and general target location.

- (1) The purpose of *visual search* is to detect targets. It is influenced by the altitude of observation, speed of the observation aircraft, terrain condi-

tions, and limitations of the human eye.

- (2) *Target recognition or identification of sighted targets* assists commanders, and especially their intelligence officers, in associating items of equipment with specific types of enemy units. For example, if an aerial observer reports an indirect fire weapon as a mortar, but does not indicate the size, then the usefulness of the information is restricted. If the observer had identified the weapon as a heavy mortar, it could have been associated with the presence of a heavy mortar unit.
- (3) *Geographical orientation and target location* complement each other. Geographical orientation is the ability of aviator-observer teams to know their position relative to any geographic reference including tactical maps, charts, airphotos, or preselected terrain feature(s). Target location is the transposition of a sighted target on the ground to a geographical representation of the terrain, such as a map or chart.
- (4) Once the target or enemy activity has been *detected, identified, and located*, it must then be *reported* to the person or agency requesting the mission. The aviator-observer team must be able to make immediate reports to the requesting unit by means of radio, message drop, or prearranged signals. If an immediate report is not required while the aircraft is in the air, the debriefing officer forwards a mission report through intelligence channels to unit(s) concerned.

(5) For detailed information on aerial observation techniques, see FM 1-80.

(6) For detailed information on aerial observation of fire, see FM 6-40.

b. Aerial Photographic and Electronic Aerial Surveillance. This type of surveillance is accomplished by employing indirect (sensors) means of aerial observation from manned or drone air vehicles. It supplements and complements the direct aerial surveillance effort. Aerial photographic surveillance includes the use of aerial cameras and infrared photographic equipment. Electronic aerial surveillance employs radar such as the side looking airborne radar (SLAR). Air photography and electronic aerial surveillance, to be technically effective, requires extensive *flight* and *processing* support.

(1) *Flight support* consists of airfield assistance (from the home airfield(s) of the operating aircraft), vectoring the aircraft to the mission area, and precisely positioning the aircraft over the target area. Aircraft may be positioned over the target area by using either ground-based radar or precision equipment (such as the Doppler Navigational System) mounted in the aircraft. In addition, flight support for manned air vehicles must include all-weather aircraft control capability, to include the ground control approach radar (GCA), en route and terminal navigational aids (beacons), and the air traffic regulation and identification system.

(2) *Processing support* consists of the film processing facility and the radar or infrared imagery interpretation capability.

46. Aerial Reconnaissance

a. General. Aerial reconnaissance missions are performed to gather specific information by observation from aircraft. The information secured normally pertains to enemy strength, disposition, and activity, and to terrain characteristics. Exact search boundaries must be assigned and the area to be reconnoitered thoroughly covered. Factors which influence the size of the area(s) that can be adequately searched are visibility; terrain; natural or manmade con-

cealment; time available; enemy air defense capabilities; nature of information desired, including its detail; proficiency of the aircrew; and flight range of the aircraft. Aerial reconnaissance missions include—

(1) *Route reconnaissance.* Route reconnaissance is the directed effort to obtain information of the route, including the obstacles and enemy forces along the route and on terrain adjacent to it which would affect passage of troops and equipment.

(2) *Zone reconnaissance.* Zone reconnaissance is the directed effort to obtain detailed information of all routes, terrain, and enemy forces within a zone defined by boundaries.

(3) *Area reconnaissance.* Area reconnaissance is the directed effort to obtain detailed information of all routes, terrain, and enemy forces within a specific and clearly defined area.

b. Armed Aerial Reconnaissance. Armed aerial reconnaissance may be employed to conduct or supplement all types of aerial reconnaissance missions. It is an organic Army capability that employs armed Army aircraft. Observation helicopters armed with machineguns, as well as some utility helicopters of a division armed with machineguns, rockets, or guided missiles (fig. 7), are capable of conducting armed aerial reconnaissance to include reconnaissance by fire. Air cavalry troops are assigned the armed aerial reconnaissance mission.

c. Visual Aerial Reconnaissance. This type of reconnaissance employs *direct* aerial observation techniques (par. 45a).

d. Airphoto and Electronic. Aerial reconnaissance employs *indirect* aerial observation techniques (par. 45b).

47. Target Acquisition

Target acquisition involves the timely detection, identification, and accurate three-dimensional location of a target in sufficient detail to permit effectively attacking it. Target acquisition results from applying information collected from all sources and agencies. Detection is the discovery of the target; identification determines the nature, composition, and size of the



Figure 7. UH-1 Iroquois firing SS-11 missile.

target for use in target analysis; and location consists of the three dimensional positioning of the target by coordinates or azimuth, by distance, and by difference in altitude from a known point.

a. *Visual* aerial target acquisition employs *direct* aerial observation techniques (par. 45a).

b. *Airphoto and electronic* aerial target acquisition employs *indirect* aerial observation techniques (par. 45b).

48. Mission Planning

Mission planning is divided into *command and staff* mission planning and *aviator-aerial observer* mission planning.

a. *Command and staff* aerial observation

mission planning involves the commander's decision in the allocation of his Army aviation aerial observation capability for the support of the intelligence effort of the command, and the intelligence officer's planning for the employment of this capability.

- (1) The intelligence officer (G2/S2) of the command (specifically the G2/S2 Air) coordinates and implements the aerial observation effort of the command. The G2/S2 Air does not issue operations orders directly to the Army aviation elements involved in aerial observation. Instead, required aerial observation missions are coordinated with the operations officer (G3/S3) of the command and appear in the opera-

tions order of command. In day-to-day operations (in the absence of a written operations order), the G2/S2 Air coordinates the aerial observation mission requirements with the operations officer (G3) and the Army aviation elements of the tactical operations center. When a mission has been processed by the staff agencies involved, the Army aviation representative forwards this mission to the Army aviation unit commander for execution. The Army aviation staff representative keeps the G2/S2 Air constantly informed of the type and amount of aerial observation capability available in the command. Normally, with this information, the G2/S2 Air can plan to employ this capability in accomplishing his portion of the information-gathering effort for the combat intelligence system of the command. The coordination of aerial observation missions, as scheduled by the G2/S2 Air, with the G3/S3 and the Army aviation staff officer is necessary for two reasons:

- (a) The G3/S3 coordinates the Army aviation support requirements involving the overall effort of the command. He can direct, in the name of the commander, that Army aviation support be provided in a manner which will best support the accomplishment of the command's mission.
- (b) The Army aviation staff officer is charged with the staff responsibility of insuring effective Army aviation support of the command. In coordination with the Army aviation unit commander, he insures that the most appropriate means are employed to accomplish a specific mission. The G2/S2 Air has exclusive staff jurisdiction over tactical air reconnaissance provided by other services (USAF, USMC, or the Air Arm of the USN). He exercises staff

supervision over the photo and imagery interpreters engaged in the Army aviation aerial observation effort. The G2/S2 Air is also responsible for the intelligence portion of the briefing and debriefing of aircrews involved in aerial observation.

- (2) The Army aviation unit commander is responsible for the execution of aerial observation missions assigned to his unit. He commands the aviation unit, controls its employment means, and insures that the unit is ready to execute assigned tasks.
- (3) Aerial observation staff mission planning consists of two types of missions: *immediate* and *preplanned*.
 - (a) *Immediate* aerial observation missions are those which cannot be foreseen and which require immediate action. As these missions usually are generated by the need to confirm reports of possible targets, sufficient equipment must be retained in an advanced state of readiness to respond promptly.
 - (b) *Preplanned* missions are those which can be foreseen and are therefore planned in advance.

b. Aviator-aerial observer mission planning involves the selection of maps and airphotos; terrain evaluation; preparation of a flight plan considering type of mission, time allocated, methods of reporting, flight route, location of known friendly and enemy forces, altitude, and direction of observation; preparation of a checklist; and equipment check. For detailed explanation, see FM 1-80.

49. Aerial Observer Training

Commanders are responsible for the training of personnel assigned aerial observer duties in their organizations. Normally, the Army aviation unit commander is responsible for the implementation of aerial observer training within the command. For detailed information, see FM 1-80.

Section II. SURVEY OPERATIONS

50. Mission Planning and Coordination

Planning and coordination insures the most effective employment of Army aviation support of the command's mission at any given time. The establishment of standing operating procedures (SOP) expedites such planning and coordination.

51. Topographic Survey

Army aviation supports topographic survey operations by transporting personnel or equipment and by providing aerial photography.

a. Transporting personnel and equipment includes, but is not limited to—

- (1) Movement of survey teams and equipment by aircraft.
- (2) Aerial supply of survey teams.
- (3) Airborne reconnaissance for surveys.
- (4) Surveys in which the aircraft becomes an integral part of the actual survey, to include—
 - (a) Aerial trilateration.
 - (b) Inertial surveys.

b. The introduction of medium observation aircraft and effective aerial camera systems afford Army aviation a capability to provide supplementary photography in support of topographic survey operations and for use in preparing hasty maps and map substitutes.

52. Aerial Artillery Survey

Aerial artillery survey objectives are to obtain direction, range, and difference in height from gun-to-target.

a. Aerial Artillery Survey Conditions. A survey technique employing rotary wing aircraft may be required when—

- (1) Large scale maps of an area are not available.
- (2) The terrain or tactical situation is such that the division artillery and artillery battalion survey parties are unable to extend survey control along the ground rapidly enough to provide control to using units.

b. Principle of Aerial Survey. The principle of aerial survey with rotary wing aircraft is

illustrated in figure 8 which shows a rotary wing survey base established on the ground by division artillery survey parties.

c. Procedures.

- (1) The aircraft flies a predetermined flight pattern, hovering over designated points. Using countdown procedures, the division artillery base and units in the division area take simultaneous instrument readings on the aircraft at each helicopter hovering point (HHP). Coordinates and height of each hovering point are determined from the division artillery base by using intersection, and are transmitted at a later time direct to the batteries of the division artillery. With the instrument readings taken at the battery and with the calculated coordinates of the hovering point, ample information is available to compute a three-point resection problem to establish locations of battery centers.
- (2) Although direction also can be established through these resection computations, it is not always reliable. Therefore, batteries should follow up the problem with an astronomical observation or participate in a simultaneous observation.

d. Reliability. The reliability of data obtained by rotary wing survey is difficult to predict. Uncontrollable elements (winds, refraction, personnel reaction time, a mobile target, and the fact that rotary wing survey combines two of the weaker methods of survey: intersection and resection) make accurate extension of survey control along the ground difficult to obtain.

53. Radiological Survey

a. Radiological survey is a directed effort to determine the extent and degree of radiological contamination in a given area. Radiological survey may be conducted from fixed or rotary wing Army aircraft. In electing to employ aerial rather than ground methods of radiological survey, the following capabilities and limitations of aerial survey must be considered:

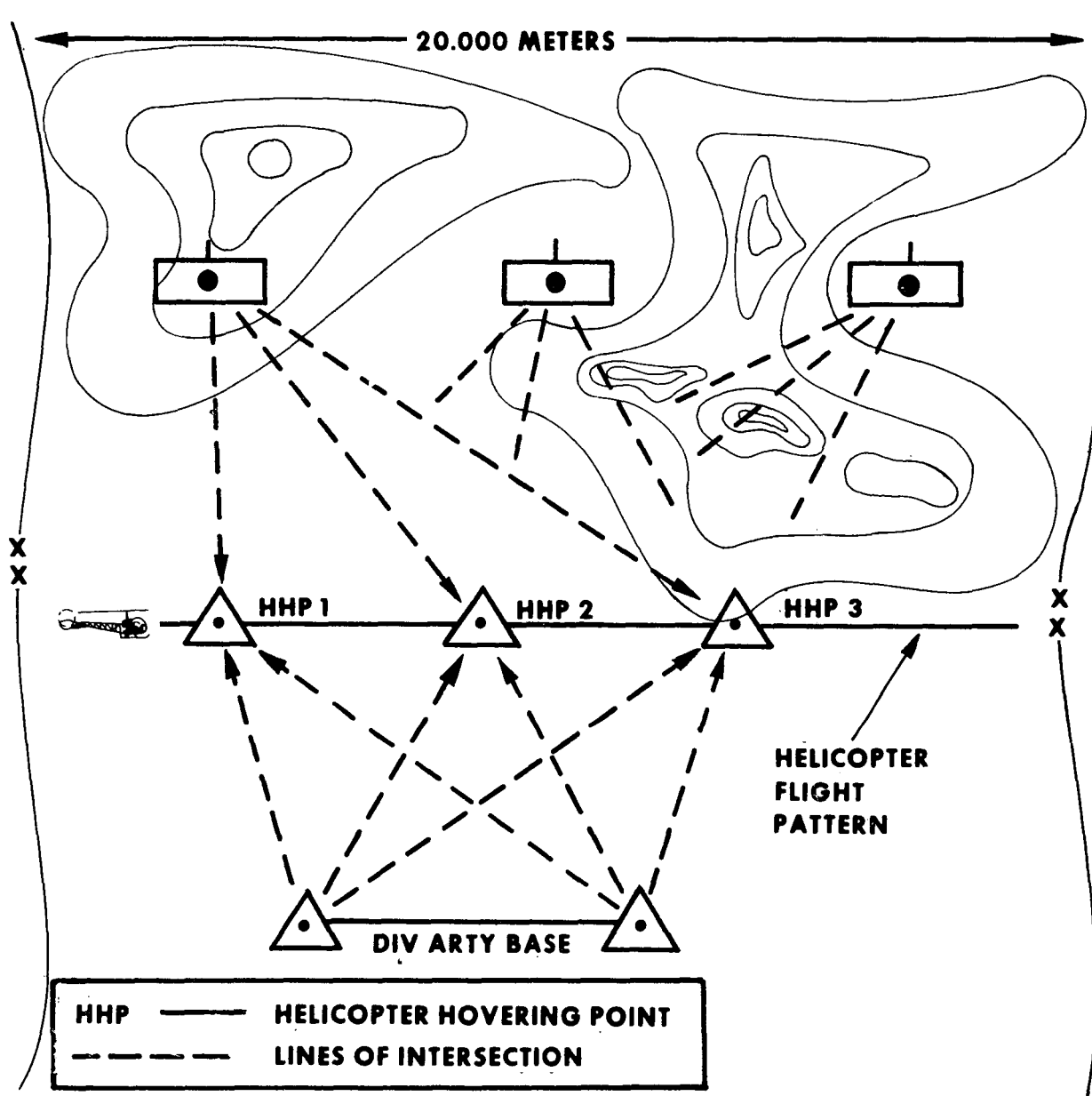


Figure 8. Artillery survey by rotary wing aircraft.

(1) *Capabilities.*

- (a) Speed and flexibility enable coverage of a large area in minimum time.
- (b) Altitude provides means of surveying areas with dose rates unacceptable to ground parties.
- (c) Minimum personnel, equipment, and communications are required.

- (d) Aircraft permit surveying of areas inaccessible to ground parties.

(2) *Limitations.*

- (a) Aerial surveys are less accurate than ground surveys because of pilot error in maintaining constant distances above ground, constant groundspeed, and because of instrument delay time.

- (b) Aerial surveys require extensive training of survey personnel.
- (c) Aircraft are vulnerable to enemy ground fire.
- (d) Existing weather conditions may preclude low-level flights.

b. Two methods of aerial survey may be conducted: the preselected point survey or the preselected course leg method. The preselected course leg method is the standard Army method of conducting radiological surveys. Details pertaining to conduct of radiological surveys are contained in FM 3-12. Although both

fixed and rotary wing aircraft may be employed in the conduct of aerial radiological survey, rotary wing aircraft are better suited because of their hovering and reduced-speed operational capacity. Groundspeeds of 50 to 60 knots will provide the most valid results. All Army aviators should be trained in the techniques of aerial radiological survey. Instructions for protecting aircrews engaged in aerial radiological surveys from possible hazards and for preventing possible damage to aircraft and equipment are discussed in paragraphs 94 through 96.

CHAPTER 8

COMBAT ZONE AEROMEDICAL EVACUATION

54. General

Current and projected weapons systems dictate greater dispersion and mobility on the battlefield. Casualty rates in future conflicts may exceed those of the past with resultant increases in patient workload and medical evacuation requirements. Army aviation will provide a means of increasing the capability to meet this need. Combat zone aeromedical evacuation operations are conducted exclusively under operational control of the responsible surgeon. The surgeon plans the employment of Army Medical Service (AMEDS) aeromedical evacuation units which must remain continuously under his operational control. When Army aviation elements are committed to patient-movement missions, they respond exclusively to direction of the responsible surgeon in regard to how and where patients are to be moved. The provisions of STANAG 2087 apply.

55. Advantages of Air Evacuation

Air ambulances have the following advantages over other means of medical evacuation:

a. Speed. Air evacuation provides the most rapid means of movement of patients from the point of injury to the medical facility that can provide the treatment necessary. This insures timeliness of treatment and contributes to the saving of lives and reduction of incapacity.

b. Range. Air ambulances are capable of transporting patients over relatively long distances in short periods of time. This attribute of aeromedical evacuation becomes more and more important as battlefields become more dispersed. Displacement of medical treatment facilities will be less frequent, and will thereby enhance continuity of medical support.

c. Flexibility. Air ambulances are relatively insensitive to terrain obstacles, and their routes are not limited to existing road nets. Patients may be taken directly to the proper

medical facility. The controlling surgeon can quickly shift his evacuation means to support any area with a high casualty density.

d. Versatility. The minimum landing site requirements of helicopters and STOL aircraft permit patients to be picked up well forward and delivered to the immediate vicinity of supporting medical treatment facilities.

e. Selectivity. Selectivity in evacuation is a function of the above four attributes. With aeromedical evacuation, individual patients can be moved directly to that medical installation best equipped for the care of the particular injury. In effect, it places specialized treatment in direct support of every forward surgeon. Time from hospital admission to surgical treatment can be minimized by diverting patient flow from overloaded hospitals to others with fewer patients.

f. Economy. Economy in utilization of medical treatment facilities is enhanced by the selectivity of aeromedical evacuation. The dispersion factor in allocation of hospitals is reduced, as all hospitals are made available for receipt of patients. Fewer specialty treatment terms are required because of the capability to move special cases to the hospital with the specialty capability, rather than attempt to place surgical specialists in every hospital. Hospitals are required to move less often, thereby reducing periods of noneffectiveness during movement and reestablishment.

g. Patient Comfort. Airlift for movement of patients reduces the patients' discomfort and shock from handling and movement over rough terrain. It permits rapid delivery of the patients to the proper medical facility in the best possible condition for further treatment.

h. Morale. A less tangible, but equally important factor in effective aeromedical evacuation is its contribution to the morale of combat

troops. The knowledge that swift, sure evacuation is available in the event of injury is reassuring to the soldier. This factor will assume increased importance on the dispersed battlefields of the future.

56. Types of : ward Medical Evacuation

Medical evacuation performed by Army aircraft is divided into two general types depending upon the in-flight patient care provided.

a. Army aeromedical evacuation is that part of the combat zone medical evacuation function which employs AMEDS air ambulances and provides in-flight medical treatment and/or surveillances.

b. Army air movement of patients is that part of the combat zone medical evacuation function which employs AMEDS air ambulances or non-AMEDS air vehicles under the operational control of the surgeon and in which prior medical treatment precludes the need for in-flight medical treatment and/or surveillance.

57. Army Medical Service Air Ambulance Units

a. Army Medical Service (AMEDS) air ambulance units are allocated to the field army for the evacuation of emergency-type casualties. Details pertaining to their organization are contained in FM 1-5 and FM 8-5.

b. The primary mission of the air ambulance service is to provide on-call Army aeromedical evacuation of seriously ill or injured patients. Secondary missions include the following:

- (1) Movement of medical personnel and/or materiel to meet a critical requirement.
- (2) Army air movement of patients when ground ambulance resources are inappropriate or inadequate to perform the task.
- (3) Augmentation of ground evacuation units as required.
- (4) Lateral shifting of patients to other medical facilities for treatment. (Current mission given in FM 8-10.)

c. AMEDS aerial ambulances (like other ambulances) are *not* used for transporting non-

medical personnel, supplies, or equipment. This restriction is in compliance with the Geneva Convention.

d. Details of combat zone aeromedical evacuation operations are contained in FM 8-10 and FM 8-15.

58. Supporting Aeromedical Evacuation Means

a. Division, corps, and field army aviation units have the capability of augmenting AMEDS air ambulance units to meet peak casualty requirements and to move patients on a scheduled basis. To the extent feasible, all Army utility and cargo aircraft are designed for use as air ambulances when required. Medical personnel and equipment are not organic to these nonmedical aviation units, but they must be provided by the medical service when other than air ambulances are used for aeromedical evacuation.

b. Augmentation aeromedical evacuation and air movement of patients is a secondary mission for nonmedical aviation units. Usually, nonmedical aviation is used for the movement of routine patients in conjunction with normal logistic support operations, the movement of large numbers of patients between hospitals upon request, and augmentation of medical air ambulance units in emergency air evacuation during peak patient loads.

c. Army air movement of patients is a secondary mission of AMEDS air ambulance units. Also, upon request of the responsible surgeon, such movement may be a contingent mission of a non-AMEDS unit which employs appropriate type air vehicles. In the latter instance, these will be scheduled movements or movements of opportunity. Scheduled patient movements involve use of backhaul capabilities of regular resupply or reinforcement sorties for transporting patients who do not require in-flight medical treatment between points pre-designated by the surgeon responsible for that segment of the evacuation system. Evacuation movements of opportunity are instituted by the medical officer in the forward facility when a requirement arises coincident with the availability of a nonscheduled aircraft which is to move to the general destination area predesig-

nated by the supporting surgeon for these patients. In this instance, the forward medical officer must arrange for the ambulance pickup of the patients at the destination airfield.

d. Augmentation aeromedical evacuation may be improvised, using these same non-AMEDS air vehicles, to meet the balance of requirements of peak periods of activity when normal aeromedical evacuation capabilities become temporarily inadequate. Improvisation consists of providing appropriate AMEDS personnel and materiel to furnish in-flight medical treatment on those aircraft whose size and interior configuration permit medical personnel to work effectively. In instances of extreme pressure on the patient evacuation system, every available space on general purpose air vehicles may be used to transport all classes of patients without mandatory provision for in-flight medical treatment. Regardless of the method used, the responsible surgeon designates the point of origin, the patients to be carried, and the destination point.

e. Individual and unit training of aviation elements with a secondary airlift movement of patients capability must insure proficiency for this mission. Medical evacuation training should include—

- (1) First aid and the preparation of patients for air movement.
- (2) Procedures and techniques for installation of litters in aircraft.
- (3) Familiarization with the organization and employment of field medical units, and the channel for requesting air evacuation.
- (4) Actual movement of simulated patients during field exercises.

59. Staff Relations, Procedures, and Planning

The surgeon is technically responsible for all medical evacuation, whether by surface or aerial means. He maintains control over all patients regardless of the means of evacuation used. He determines the pickup site and destination for all patients moved by air. The surgeon directs the employment of AMEDS air ambulance units with necessary coordination with the staff aviation officer and air traffic control agencies. He determines requirements for air evacuation, and transmits requests for support by nonmedical aviation units to the staff aviation officer. The surgeon is responsible for medical training of aviation personnel and the provision of staff medical advice to the commander and the staff aviation officer.

CHAPTER 9

CIVIL DEFENSE

60. Authority

Policy guidance and responsibilities of Department of the Army agencies with respect to operations involving participation in natural disaster relief activities are prescribed in AR 500-60. If, after investigation by the appropriate Army commander, it is decided that the Army aviation under his jurisdiction will be used in the relief operations of civil disaster, he will organize a provisional Army aviation disaster search and rescue unit including such aircraft and personnel as necessary. The officer designated to command this unit normally should be the senior aviation staff officer within the command. This unit will be based, whenever possible, on existing Army, Navy, Air Force, Coast Guard, or National Guard installations within the area nearest the disaster and will follow prescribed procedures for drawing necessary supplies. SOP's should include procedures applying to this type operation.

61. Missions

Missions that may be performed by Army aircraft in disaster and emergency relief operations include—

- a.* Aerial delivery of medicine, food, and emergency supplies in small quantities.
- b.* Limited air evacuation of sick and wounded.
- c.* Guiding surface rescue parties.

- d.* Message drop and pickup.
- e.* Radio relay operations.
- f.* Courier service.
- g.* Insect control.
- h.* Wire laying for emergency communications.
- i.* Illumination for night operations.
- j.* Photographic and reconnaissance missions.
- k.* Warning missions.
- l.* Dropping informational bulletins pertaining to—
 - (1) Areas to be evacuated.
 - (2) Advice urging the population to move voluntarily to specified refugee accommodations as directed.
 - (3) Transportation facilities.
 - (4) Available escape routes.
 - (5) Measures to be taken to protect personal property and livestock.

62. Plans

The civil disaster and emergency relief plan of commanders of Army areas and major over-sea Army commands should clearly outline the missions, responsibilities, and duties of the Army aviation disaster emergency relief units with respect to administration, operations, maintenance, food service, supply, transportation, medical facilities, and security.

CHAPTER 10

SEARCH AND RESCUE

63. General

Army aviation may participate in military and civilian search and rescue missions and, because of personnel training and type of aircraft used, can be very effective in these operations. Search and rescue missions may include situations of national disaster, missing persons, missing aircraft, or aircraft downed in enemy territory.

64. Responsibilities and Coordination

a. Civilian Operations. Normally, Army aircraft will join forces with other agencies in search and rescue missions. Liaison must be maintained with the responsible agency, and coordination for supply and maintenance must be accomplished with the nearest military installation. Areas and methods of coverage will be assigned by the responsible agency, which, in cases of downed civil aircraft or lost civilian personnel, will be the civil air patrol. AR 95-10 is the authority for Army aviation participation in civilian search and rescue operations.

b. Military Operations.

- (1) In a nontactical situation, a search and rescue mission for downed military aircraft will normally be the responsibility of the local USAF air rescue service or comparable Navy or Coast Guard organizations. When requested, Army facilities will be made available. Liaison and coordination should be accomplished by Army aviation units assigned the task of giving assistance. Areas to be searched will be assigned. When Army aircraft are involved in the local flying area, the Army aviation unit concerned may perform its own search and rescue operations. Details of this type of operation should be included in the preaccident plan (ch. 18 and app. VIII).

- (2) To minimize the loss of aviators and crews in tactical operations, each Army aviation unit must have an effective search and rescue plan. This plan will be prepared by the operations officer in close coordination with the unit intelligence officer. Prior to departing on any mission over enemy lines, aviators must be briefed on evasion and escape details including pickup points for rescue if downed behind enemy lines. This briefing will normally be conducted by the unit briefing officer in coordination with the intelligence and operations officers.

65. Planning

a. Civilian and Noncombat Missions. Plans for civilian and noncombat search and rescue missions will be prepared by the agency responsible for the operation and will include the same elements as discussed in paragraph 62.

b. Tactical Operations. Gridded and coded maps should be prepared to cover the unit of responsibility (fig. 9). Each aircraft should carry a copy of the grid map to facilitate reporting its position when a forced landing is imminent or its location when downed. On each mission over enemy territory, rescue pickup points will be designated for the crew and passengers. These locations must be carefully selected to avoid areas of known enemy occupation. To facilitate the pickup, prearranged signals must be coordinated to enable the rescuing aviator to identify the individuals to be rescued. Places and signals for downed personnel to cross friendly lines must be known by and coordinated with all concerned. When on a mission, aviators should make frequent position reports to their units. These reports will facilitate search and rescue operations.

c. Search Operations. Search operations

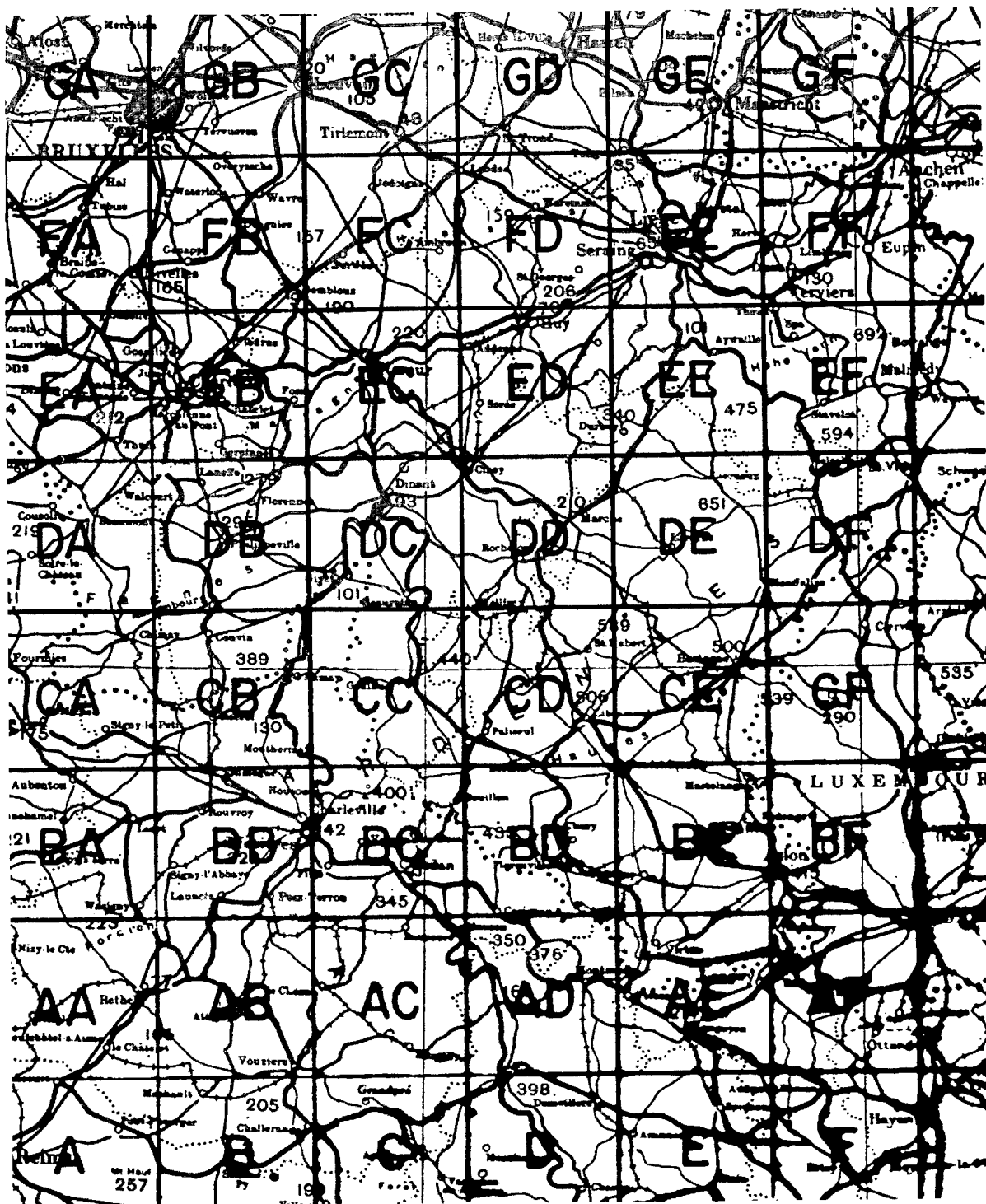


Figure 9. Gridded map.

should be adapted to the existing weather and terrain conditions, and should be flexible enough to permit changes when necessary.

d. *Search Plans.* Search plans should be as simple as practical since navigational difficulties increase when the plan requires flying numerous compass courses during the mission.

66. Methods

Aviation search missions usually employ single aircraft within assigned subareas or along designated courses; the whole operation is coordinated to insure coverage of the search

area. If the number of available aircraft is insufficient to conduct a thorough search of the entire area, it is better, as a rule, to conduct a general search of the entire area than to make a detailed search of only that portion believed to be critical. Types of search patterns and their application are as follows:

a. *Square Search Pattern.* A square search pattern (fig. 10) is most adaptable to a tactical situation, and is conducted as follows:

- (1) Start from any point in the search area and fly approximately 1 mile in a given direction;

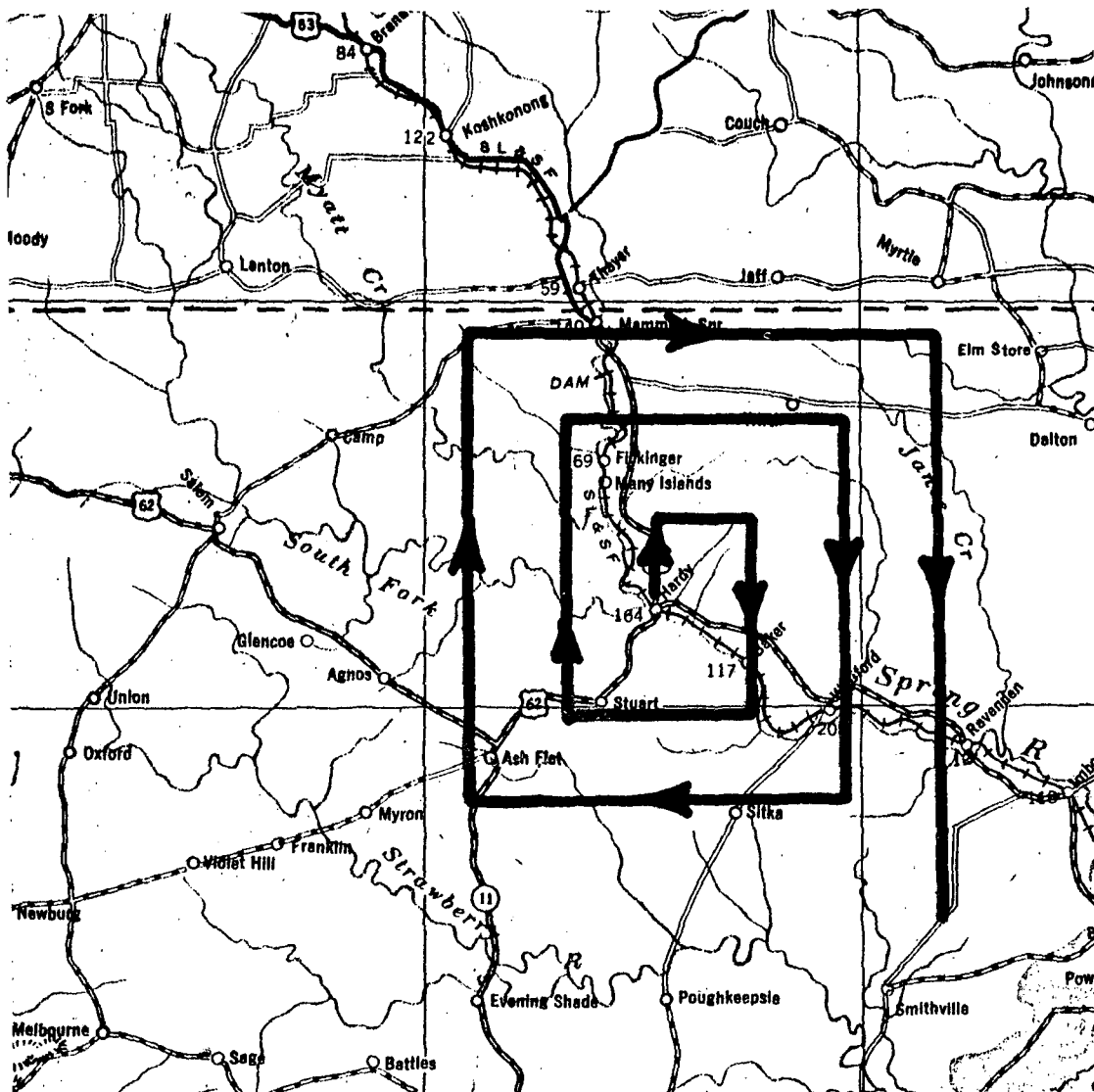


Figure 10. Square search pattern.

- (2) Turn 90° and fly the same distance; then
- (3) Make another 90° turn in the same direction as the first turn and fly twice the distance (approximately 2 miles) before making the third 90° turn.

Note. The distance is increased on each leg of the pattern to expand the area of search.

b. Radial Search Pattern. The radial search pattern is a method wherein several aircraft leave a common point and fan out radially (fig.

11). Radial search can be employed by a larger number of short-range aircraft operating from a single base. Since all aircraft leave their point of origin simultaneously, equal coverage is obtained in all radial directions of the search in approximately the same length of time. However, search limits are somewhat short because the aircraft fan out, thereby reaching a distance on the radials beyond which the search interval would be excessive. Except near its outer limit, the area covered is not as great as in other methods. There are two forms of radial search: radial search followed by parallel track, and radial search with return search.

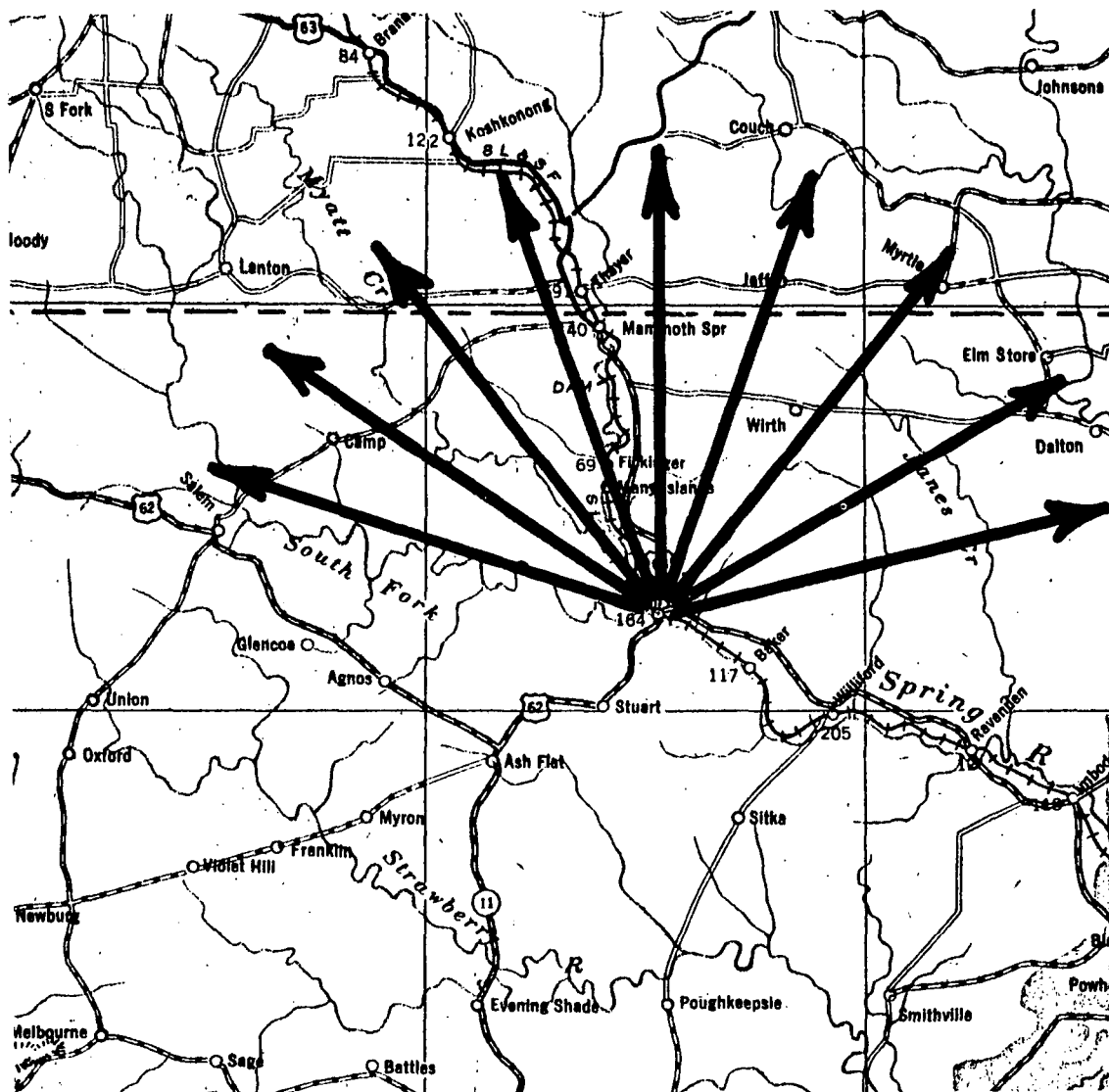
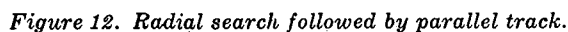


Figure 11. Radial search pattern.

- c. Parallel Search Pattern.* The parallel search pattern (fig. 14) is formed by several aircraft departing from a starting line at pre-



scribed space intervals, all aircraft routes being maintained along the same compass heading over the area to be searched. Parallel search provides equal coverage by uniform spacing and routing of aircraft. For parallel search, the aircraft are flown from their operating bases to initial positions along the edge of the area to be searched. Normally, the aircraft are spaced at a distance equal to twice the radius of visibility or less, as determined by the degree of concentration desired and the necessity to offset possible changes in visibility. Orders for the search pattern should be issued well in advance. Last minute changes or orders should

be avoided. If several aircraft are to search and one drops out shortly before the mission is to be flown, the plan of search generally should be followed rather than attempt last-minute adjustments. Maximum search distance from the starting line is determined by the requirements of the missions. Normally the aircraft will—

- (1) Proceed on course to a predetermined spot.
- (2) Fly 90° from the original track for a distance of one-half the radius of visibility, then

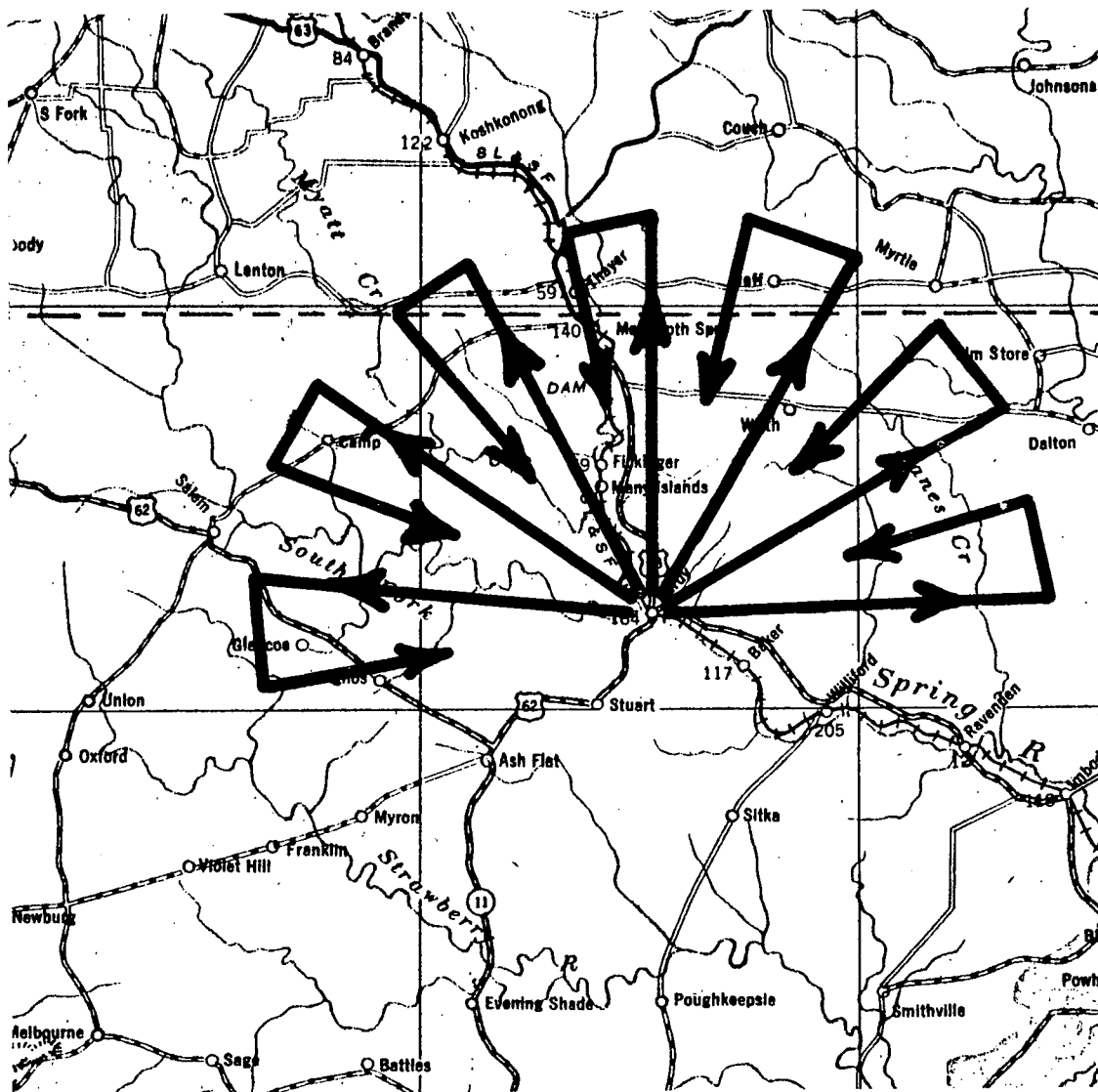


Figure 18. Radial search with return search.

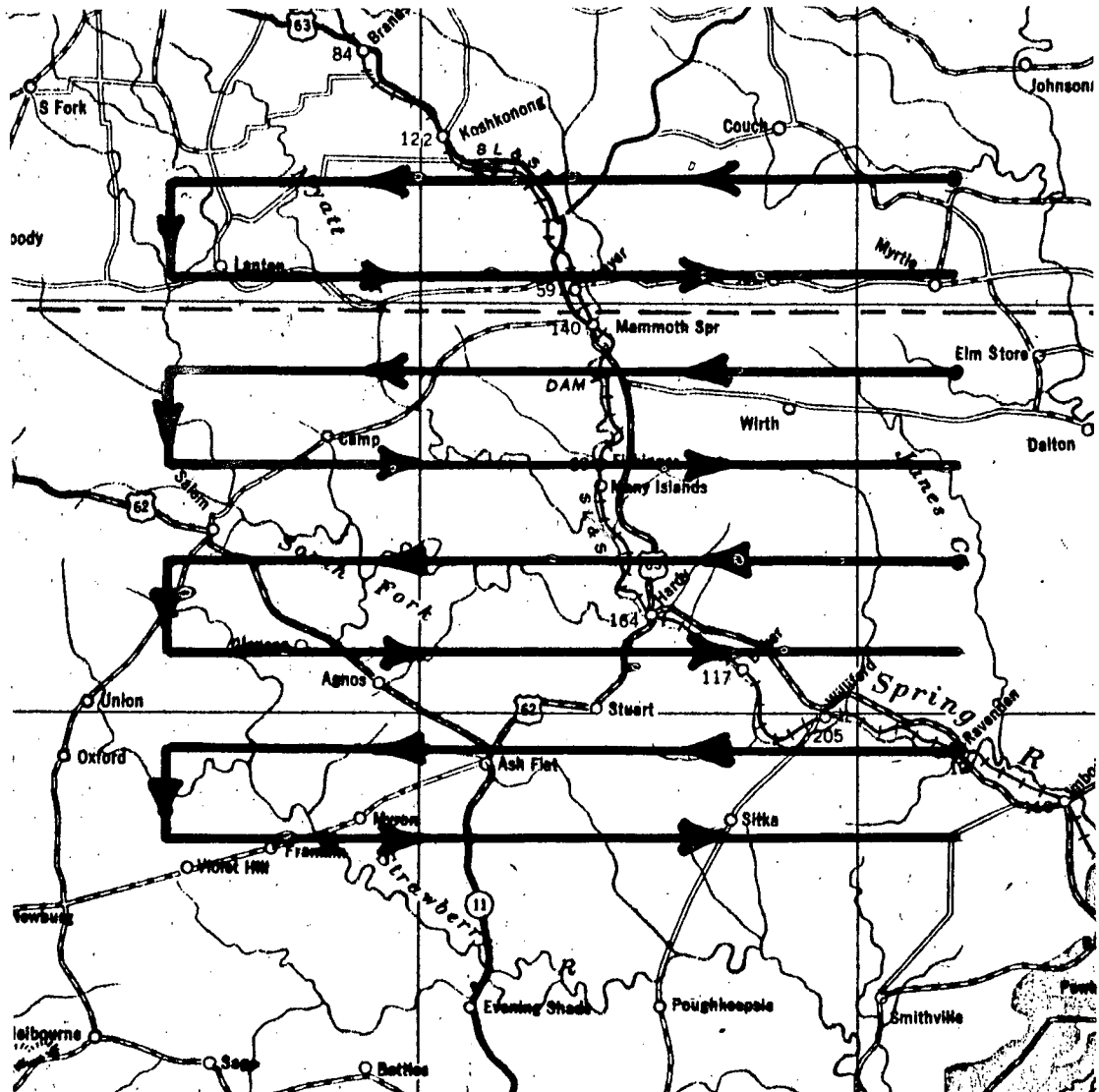


Figure 14. Parallel search pattern.

(3) Return parallel to their original track (fig. 14).

d. S-Turn Search Pattern. The S-turn search proceeds down a road or given path as shown

in figure 15. This type search is beneficial when aircraft availability is limited, visibility conditions are poor, and the travel route of the object of search is known.

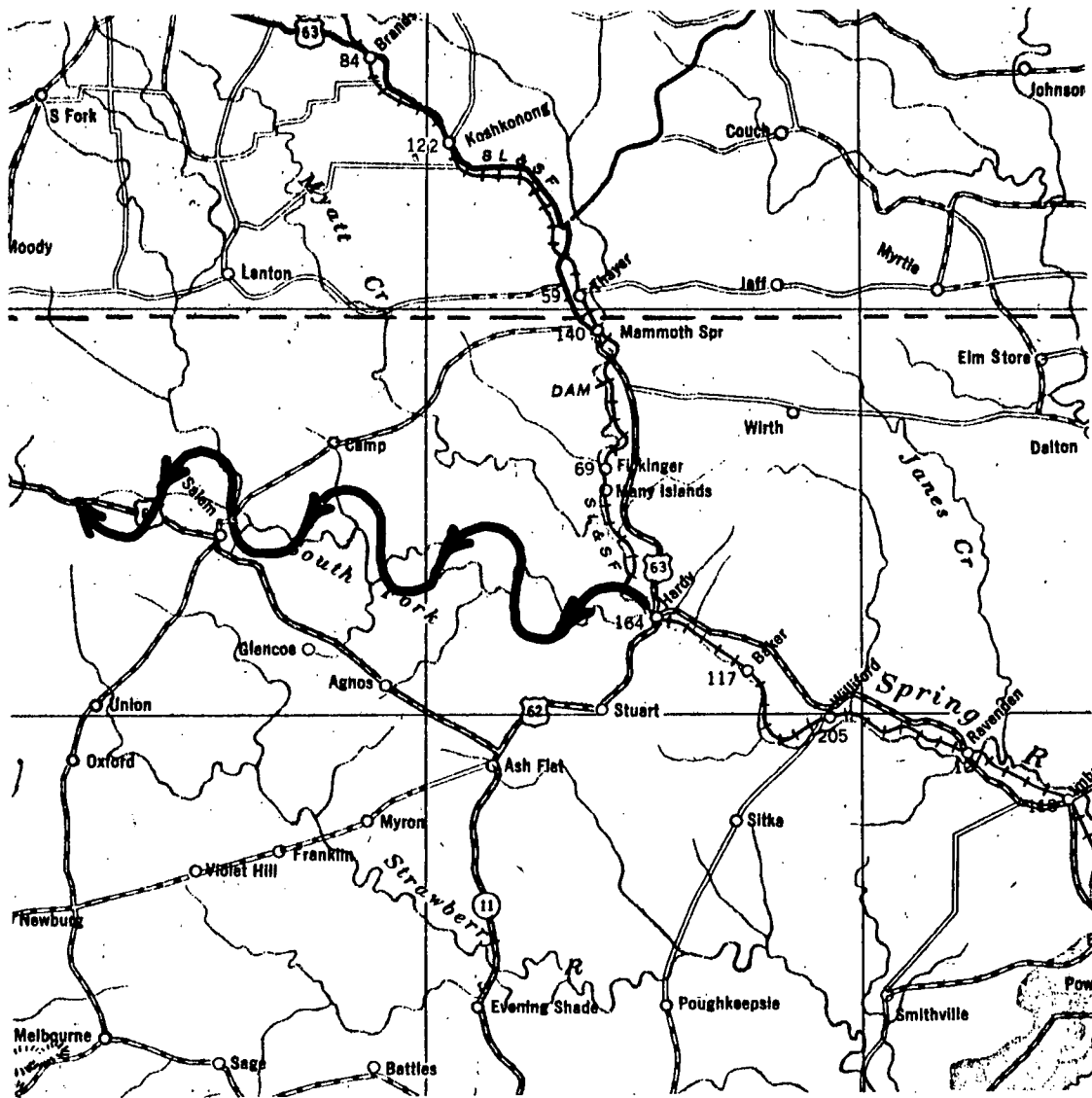


Figure 15. S-turn search pattern.

PART THREE

EMPLOYMENT

CHAPTER 11

TACTICAL EMPLOYMENT

Section I. GENERAL

67. Concepts

Army aviation support greatly enhances the versatility and flexibility of a ground unit's employment on the battlefield in nearly all types of operations. Like other support agencies, Army aviation units are organic to tactical and administrative units as dictated by habitual use and unit mission. Where units have no habitual use for Army aviation support, aviation is pooled at higher echelons to provide support where needed and to achieve maximum flexibility. Army aviation units, regardless of size or composition, must be employed in a manner that will allow decentralized execution of functions. Although some of the aviation effort must be centrally controlled, support elements of aviation units must be capable of operating for, and with, supported units.

68. Principles of Employment

To insure maximum efficiency, employment of Army aviation should be based on the following principles:

a. Economy of Use. Aircraft should not be employed when other means can more effectively accomplish the mission. Economy of use is realized by assigning specific aviation units and/or aircraft to perform missions which they are best capable of performing and by scheduling aircraft to assure their maximum continual use.

b. Freedom of Utilization. Freedom of utilization permits a commander to employ organic, attached, or supporting Army aviation units in the way which contributes most to the successful accomplishment of his mission.

c. Immediate Availability. Immediate availability increases the value of Army aviation to the supported commander. Availability is facilitated by flexible organization, mobility, proper scheduling of aircraft, proper maintenance support, and by locating aviation facilities near the area of intended use.

69. Planning Employment

a. Basis for Planning. Army aviation planning is based on the tactical plans of the units to be supported. For planning, employment, and characteristics of divisional tactical operations, see FM 61-100.

b. Factors Affecting Employment. The following factors should be analyzed when planning for the employment of Army aviation.

- (1) *Mission.* Missions assigned to aviation units, as well as missions of the supported units, must be considered. Army aviation support must be integrated into, and based upon, the fire support plan and scheme of maneuver of the supported units. To insure availability of aircraft for all operations, future missions must be considered and priorities established.
- (2) *Enemy.* The location, disposition, and capabilities of the enemy—especially his air defense—must be considered. However, nap-of-the-earth flying and offensive fires will aid Army aircraft employed in the vicinity of enemy forces.
- (3) *Weather.* Weather is important in planning the employment of Army aviation support. Low ceilings and

limited visibility reduce enemy air and ground action and can be advantageous during some combat operations. Rotary wing aircraft are particularly adaptable to marginal weather conditions. Present navigational systems permit aircraft operation under a wide variety of weather conditions.

- (4) *Terrain.* Terrain must be considered when planning locations for airfields, heliports, and alternate landing areas; locations for navigational aids; routes for ground supply; communications support; and local security. As more rotary wing aircraft become available. Army aviation operations are less restricted to prepared landing areas.
- (5) *Training readiness.* The training and proficiency of aviation personnel must be analyzed when planning for the employment of Army aviation. For maximum use of aviation support, Army aviators must be adequately trained and proficient in instrument flying, short takeoffs and landings, use of aerial weapons, low-level navigation, and operation of electronic detection equipment. The training of mechanics, radio repairmen, electronic equipment operators, and observers must also be considered.
- (6) *Aviator and aircraft availability.* Availability of aircraft and specially trained aviators, suitable equipment, and adequate maintenance support must be considered when planning the employment of aviation units. Maintenance should be flexible enough to insure maximum availability of aircraft to support an operation.
- (7) *Vulnerability.* Army aircraft should be employed in a manner that will minimize losses. Combat losses should be anticipated. Losses can be reduced by proper coordination and by the use of surprise; maneuver; proper flight techniques; ground security; and fire support to include artillery fire, tactical airstrikes, and armed Army air-

craft. Both the aircraft and the pilot are particularly vulnerable to the effects of nuclear weapons. Aircraft are most seriously affected by the blast effect which creates extreme turbulence in the air. On the ground, flying debris is an additional hazard. Pilots are most vulnerable to the dazzle effect which can cause temporary blindness at great distances from the burst.

- (8) *Length of operation.* The length of an operation should be considered when planning for aviation support. This will affect maintenance requirements, aviator fatigue, and logistics; it may require displacement of facilities, location of new landing areas, and night operation.
- (9) *Airspace utilization.* When planning Army aviation employment, consideration should be given to the use of available airspace (other Services' aircraft, air defense artillery, and surface-to-surface fires of all types). The efficiency of Army air traffic regulation and identification facilities to coordinate with the other users of the airspace will greatly affect the employment of Army aviation units.
- (10) *Logistical requirements.* Primary logistical requirements influencing the employment of Army aviation are POL, ammunition, and maintenance. These require special consideration when planning aviation support.
 - (a) *POL.* Aircraft POL requirements consist of a wide variety of fuels which are consumed in relatively large quantities. These fuels require special handling, and refueling facilities should be readily available.
 - (b) *Ammunition.* Only small quantities of ammunition can be carried on Army aircraft. Therefore, reloading facilities must be located near the area of operation.
 - (c) *Maintenance.* To assure availability of aircraft, maintenance requires that a certain percent of the air-

craft be kept in reserve for replacement, normal inspection and repair, and for transport of maintenance teams to aircraft downed because of mechanical failures.

- (11) *Security restrictions.* Aircraft employment may be limited by security restrictions imposed by the commander (e.g., radio silence for a given period of time or a limited number of flights in a given area).
- (12) *Control.* Aircraft control is dependent upon an efficient communications system which permits aviation commanders and staff officers to issue instructions and enables the air traffic regulation and identification system to function efficiently.
- (13) *Coordination of mutual support.* Aviation units and aircraft must be employed in such a manner as to prevent overlapping responsibilities. Duplication of effort may easily occur during missions involving observation or surveillance, fire adjustment, and reconnaissance.
- (14) *Dispersion.* Under nuclear warfare conditions, Army aviation units should be dispersed to multiple landing areas, but should maintain company or platoon integrity when possible. This dispersion will result in increased maintenance time, additional ground security requirements, and a slower reaction time. However, proper planning can minimize the disadvantages caused by dispersion.

c. Planning Sequency. The procedures for planning aviation support are as follows:

- (1) Analyze the mission and the commander's planning guidance to determine where and when Army aircraft will be needed.
- (2) Consider all pertinent factors when estimating aviation requirements.
- (3) Develop practical plans to provide the necessary Army aviation support.

- (4) Coordinate the plans with those of all users of the airspace including air defense elements, aviation units, and supported units.
- (5) Based on the commander's decision and concept of the operation, finalize the aviation support plan and disseminate the plan to all appropriate headquarters. This plan may be issued as the Army aviation annex to the operations order.

70. Employment of Fixed and Rotary Wing Aircraft

a. Observation. Observation aircraft are used to observe (through visual or other means) and report information on composition and disposition of enemy forces, troops, and supplies, and to adjust artillery fire. In addition, they are used for command, control, liaison, lightweight resupply, reconnaissance, and emergency evacuation.

b. Attack. Attack aircraft are used to search out, attack, and destroy enemy targets, employing conventional or special weapons. They are also used for limited interdiction and very close air support missions. They provide armed escort and conventional artillery and automatic weapons-type base of fire. When suitably armed, they are used as highly mobile antitank weapons.

c. Utility. Utility aircraft are used for miscellaneous missions such as cargo an/or passenger transport, patient movement, small unit tactical transport, and command and control. Utility aircraft include those that have a small payload.

d. Cargo. Cargo aircraft are used for assault support and logistical cargo and troop transport within the battle area. They may also be used for such specialized missions as refueling, resupply of ammunition to combat formations, and the evacuation of casualties or damaged equipment. In addition, cargo aircraft possess a VTOL capability that permits them to be used as flying cranes to transport surface vehicles and other heavy equipment over natural or manmade obstacles.

Section II. AVIATION IN SUPPORT OF OFFENSIVE OPERATIONS

71. Advance to Contact

The advance-to-contact tactical maneuver is used to gain contact, or re-establish contact, with the enemy. It is usually conducted on a broad front and is characterized by decentralized control and piecemeal commitment of forces. Army aviation may be employed to support divisional advance-to-contact operations by providing—

a. Reconnaissance and surveillance of road nets, avenues of approach, and defiles ahead of the advance guard.

b. Reconnaissance and security (including use of armed aircraft) for the advance guard, covering force, and flank and rear area security forces.

c. Assistance in control of columns.

d. Airlift for airmobile forces conducting operation to seize key terrain essential to the uninterrupted advance of the command.

e. Immediately responsive airlift for airmobile reserve forces.

f. Aeromedical evacuation, patient movement, and airlift of supplies.

72. The Penetration

Penetration is a form of offensive action which seeks to rupture the enemy's defensive position, widen the gap created, and destroy the continuity of his positions. The divided enemy forces are then destroyed, and mobile forces exploit the enemy rear areas. Army aviation may be employed to support divisional penetrations by providing—

a. Aircraft to augment communications and control, especially during multiple penetration attacks.

b. Reconnaissance to determine enemy weak points.

c. Aerial movement of reserves to exploit success.

d. Airlift for airmobile forces conducting operations to seize limited objectives, seal off approach routes of enemy reserves, and seize critical terrain on the flanks of the penetration.

e. Aerial delivery of critical items to forces engaged in deep penetrations.

f. Support for containment of bypassed enemy forces by aerial observation, adjustment of fires, and movement of troops.

g. Assistance for partisan forces, as directed, such as transportation for their leaders, distribution of supplies, and dissemination of instructions.

h. Aeromedical evacuation and patient movement.

73. The Envelopment

The envelopment is a form of offensive maneuver in which the main attack is directed against the flank or rear of the initial disposition of the enemy's forces and toward an objective behind his frontlines. It usually includes a supporting attack directed against the enemy's front. Army aviation may be employed to support divisional envelopments by—

a. Providing reconnaissance and surveillance to locate assailable flanks and to confirm that enemy weak areas are not part of a trap.

b. Delivering long range patrols along the enemy's flank and along routes to be used by the enveloping force.

c. Providing airmobility for forces.

d. Conducting deception missions, as directed.

e. Providing aircraft to augment communications, command control, aerial observation, and adjustment of fire.

f. Providing armed helicopters for aerial fire support.

g. Providing aeromedical evacuation and patient movement.

74. The Infiltration

The infiltration is the movement of individuals or vehicles, singularly or in small groups, at extended and irregular intervals. This movement is used when maximum secrecy and deception are desired. It provides the best possible protection from enemy air observation and attack, but is very difficult to control. Army

aviation may be employed to support divisional infiltration by—

a. Augmenting communications and command control to link widely dispersed elements, coordinate their attacks, and assist in their assembly.

b. Airlifting part or all of the infiltrating force.

c. Conducting deception missions.

d. Locating gaps in enemy defenses.

e. Airlifting equipment and supplies to elements behind enemy lines.

f. Providing aeromedical evacuation and patient movement.

75. The Exploitation and Pursuit

The exploitation is the phase of offensive action, usually following a successful penetration or envelopment, characterized by rapid advances against lessening resistance. Its purpose may be to take an objective deep in the

enemy rear or to pursue a retreating enemy force. The pursuit is an offensive action against a retreating enemy force; it may consist entirely of direct pressure or a combination of direct pressure and encircling movement. Army aviation may be used to support divisional exploitation and pursuit operations by—

a. Providing aircraft to augment communications, command control, aerial observation, and adjustment of fire.

b. Maintaining contact with the enemy by observing his location and movements.

c. Airlifting rapidly consumed supplies (especially class III).

d. Providing reconnaissance and surveillance for flank and rear area security.

e. Providing aerial movement of troops and equipment to key positions on the enemy's flank or rear, prior to the arrival of enemy forces.

f. Providing aeromedical evacuation and patient movement.

Section III. AVIATION IN SUPPORT OF DEFENSIVE OPERATIONS

76. Mobile Defense

Mobile defense is that type of defense in which the bulk of the defending force is held as a striking force with the remainder manning the forward defense positions as the fixing force. Mobile defense consists of security forces, fixing forces, and a strong striking force. The defender seeks to engage the enemy in decisive action at a time and place of the defender's own choosing, relying principally on vigorous and bold offensive action to destroy the enemy in the most favorable tactical localities. Destruction of the enemy is not limited to the area being defended.

a. Security Force. Army aviation may be used to support security forces by providing—

- (1) Army aircraft to the covering force or general outpost for reconnaissance, surveillance, adjustment of long-range fires, command control, airlift of supplies, and aeromedical evacuation and patient movement.

- (2) Airlift of forces to establish combat

outposts observation posts, and patrols.

- (3) Aerial reconnaissance and surveillance units to cover gaps between strong points.

b. Fixing Forces. Army aviation can help fixing forces detect impending enemy attacks; delay, disorganize, and inflict maximum damage on the enemy; and canalize the enemy into areas for suitable counterattack by providing—

- (1) Aircraft to augment communications and command control.
- (2) Reconnaissance and surveillance, in conjunction with foot patrols, between strong points and observation points.
- (3) Airlift for troops and supplies, adjustment of fires, and aeromedical evacuation and patient movement.
- (4) Aircraft for aerial radiological surveys and inspection of camouflage.

c. Striking Force. A striking force is a portion of a body of troops which is kept to the rear or withheld from action at the beginning

of an engagement, but is available for a decisive movement. Priority of aviation support should be given to striking force commanders, when committed, by providing—

- (1) Airlift for commanders and staff officers during planning of counterattacks.
- (2) Airlift of troops to expedite counterattack or to place the forces in a more advantageous position.

77. Area Defense

Area defense is designed to retain specific terrain for a period of time with forces deployed to stop and repulse the attacker. An area defense force consists of security and forward defensive elements and a reserve. The function of the reserve is to block and destroy the enemy, eliminate penetrations, or reinforce threatened areas. Army aviation can be used to support divisional area defense operations in much the same manner as in the mobile defense (par. 76).

78. Special Defensive Considerations

There is a constant threat of an enemy armor penetration, airborne assault, guerrilla action, or infiltration of an enemy force within divisional areas. Army aviation may assist in countering this threat as follows:

a. Defense Against Armor Penetration. Armed aerial vehicles are particularly valuable where expeditious counteraction is necessary to prevent further success of enemy armor (e.g., antitank missiles can destroy enemy armor). Aircraft can assist in the early detection of enemy armor through visual observation or use of electronic surveillance devices. Planning should include the use of Army aircraft along likely avenues of approach.

b. Defense Against Airborne Assault. A key defense against airborne attack is the use of highly mobile, responsive reserves. Army aircraft may be used to rapidly transport reserves to areas where they can counter airborne assaults. Small airborne forces may be destroyed or neutralized by air cavalry units.

c. Defense Against Guerrilla Action. Guerrilla warfare refers generally to combat activities conducted by irregular forces, frequently in small groups. For discussion of counter-guerrilla operations, see paragraphs 81 through 83.

d. Defense Against Infiltration Forces. The primary defense against infiltration is surveillance. Army aircraft can be employed for reconnaissance and surveillance missions over likely infiltration routes. Where infiltration has been successful, Army aviation may be used to rapidly transport forces to counter the infiltrating groups.

Section IV. AVIATION IN SUPPORT OF RETROGRADE OPERATIONS

79. Withdrawal

A withdrawal is an operation in which all or part of a deployed force disengages from the enemy; however, contact is maintained to prevent rapid advance of the enemy. Night withdrawals are preferred over daylight withdrawals. Army aviation can be employed to support divisional withdrawal operations by—

- a.* Assisting in reconnaissance of new positions and routes to these positions.
- b.* Providing armed aerial reconnaissance to delay the enemy and destroy advance enemy patrols.
- c.* Employing deceptive measures.

d. Transporting air cavalry units for use as security forces and positioning patrols.

e. Assisting in withdrawal of security forces over difficult terrain.

f. Providing aerial platforms for traffic and command control.

g. Providing aeromedical evacuation and patient movement.

h. Providing night illumination.

i. Providing aerial observation and adjustment of fire.

80. Delaying Action

A delaying action is an operation in which maximum delay and damage are inflicted on an

advancing enemy without the delaying force becoming decisively engaged in combat. Army aviation can be employed to support divisional delaying action by—

a. Assisting in reconnaissance of the initial delaying position, routes and coordinating points, and the successive delaying positions.

b. Providing aerial transportation with armed aerial escort for the conduct of airborne operations.

c. Transporting air cavalry units to be used as flank security forces and positioning patrols.

d. Providing aerial fire adjustment and aeromedical evacuation and patient movement.

Section V. AVIATION IN SUPPORT OF COUNTERINSURGENCY OPERATIONS

81. General

Counterinsurgency operations include military civic action programs and counterguerrilla activities. Army aviation can materially assist both types of operations.

82. Civic Action Programs

Army aviation can be used to support the civil population by conducting the following specific missions:

a. Transporting civilian specialist teams (e.g., medical, engineer, agriculture, and educational) to isolated areas requiring their services.

b. Transporting key governmental political figures to remote or isolated areas for morale purposes.

c. Airlifting emergency supplies to isolated areas.

d. Conducting aerial survey or mapping operations.

e. Evacuating sick or wounded from isolated areas.

f. Disseminating propaganda by leaflet drop and aerial loudspeaker operations.

g. Improving civilian health and sanitation by delivering aerial spray against insects.

h. Delivering government intelligence agents.

i. Providing emergency courier or radio relay service.

j. Moving troop reaction forces and providing fire support for villages protected only by civil guard units when under guerrilla attack.

83. Counter guerrilla Operations

Army aviation can support counter guerrilla operations which include population control,

isolation of guerrilla forces from outside support, psychological operations, intelligence activities, and tactical military operations.

a. *Population Control.* Population control measures must be implemented to prevent the guerrilla from receiving the active and passive support of the people. Army aircraft can be used to assist in this control by—

(1) Moving troops or police to block off sections of roads or trails during search operations. The area between the blocks can be patrolled by reconnaissance aircraft to detect any person leaving the area or any vehicle being unloaded.

(2) Moving supplies and personnel during resettlement.

(3) Providing observation and communications during riot control operations.

(4) Spraying tear gas during riots.

(5) Moving police or troops in surprise operations to seal off and search remote villages and towns.

(6) Conducting reconnaissance and surveillance over restricted areas.

b. *Isolation of Guerrillas.* To help isolate the guerrillas from support received from outside the country, Army aviation can—

(1) Conduct reconnaissance and surveillance along borders and coasts.

(2) Attack, with armed aircraft, personnel moving through border-restricted zones on foot or in vehicles.

(3) Conduct surveillance over drop and landing zones which could be used for delivery of personnel and supplies in support of guerrilla forces.

(4) Move combat units in pursuit of groups which have crossed borders or have moved inland from the sea.

- (5) Position and supply ground observation posts or patrols.

c. Psychological Operations. Army aircraft can assist psychological operations by—

- (1) Disseminating leaflets.
- (2) Broadcasting propaganda messages from aerial loudspeakers.
- (3) Moving the following types of equipment to different areas for propaganda purposes: small presses, radios, ground broadcast equipment, and movie projector equipment.

d. Intelligence. Intelligence is vital to successful conduct of counter guerrilla operations. Army aircraft can assist in gathering intelligence of guerrilla forces by—

- (1) Conducting day and night photography of specific locations or areas. Such photography can be used for many purposes such as locating cultivated areas for growing food crops, jungle clearings, new trails, changes in condition of isolated huts or villages, night construction of ambush sites, and indications of guerrilla use of specific areas.
- (2) Conducting area search missions. These are continuous aerial searches of large areas for information as to unusual changes in activity. The same aerial observers should, if practicable, be used in each area.
- (3) Conducting specific searches of a limited area when other information indicates possible guerrilla activity.
- (4) Locating potential drop and landing zones and making frequent checks to determine if the guerrillas have emplaced antiairborne obstacles.
- (5) Conducting route reconnaissance to determine the condition of roads or trails and make a last-minute check of possible ambush sites.
- (6) Establishing contact with informers or agents, to include radio contact.

e. Military Tactical Operations. Counter guerrilla tactical operations include establishing security of villages, key installations, and convoys; patrolling; and conducting raids and encirclements.

- (1) To help establish security of villages and key installations, Army aircraft can —
 - (a) Transport barbed wire, mines, ammunition, and weapons as necessary.
 - (b) Move additional police, guard, or troop reaction forces to the villages or installations that come under guerrilla attack.
 - (c) Provide night illumination.
 - (d) Provide radio relay on a specified time schedule.
 - (e) Provide aerial fire support.
- (2) Army aircraft can help provide convoy security by—
 - (a) Conducting route reconnaissance.
 - (b) Providing armed escort. In this type of operation, plans should be made to have relief aircraft available for continuous operation over the convoy.
 - (c) Transporting a standby reaction force in the event the convoy is ambushed.
 - (d) Moving demolition specialists to mined areas or bridges if they are discovered by the convoy.
 - (e) Providing night illumination if the convoy has been trapped between cratered areas in a road and cannot complete the trip before dark.
- (3) Counter guerrilla operations are characterized by extensive patrolling to find, fix, fight, and defeat the guerrilla. Army aircraft can assist with patrolling by—
 - (a) Positioning patrols deep in difficult terrain.
 - (b) Reinforcing small patrols to carry out raids against larger guerrilla forces.
 - (c) Supplying patrols on extended operations.
 - (d) Evacuating casualties.
 - (e) Providing radio relay at specified times.
 - (f) Providing transportation for withdrawal of the patrol.
 - (g) Providing fire support for the patrol.

- (h) Locating lost patrols by homing on FM radios or implementing search procedures.
 - (i) Providing detailed information on terrain in an area where map coverage is inadequate.
 - (j) Providing the means in advance for aerial reconnaissance by the patrol leader and other key members of his party.
- (4) Raids against guerrilla forces or base camps are necessary. Army aviation can enhance the success of raids by—
- (a) Transporting the raiding party to the area of operations.
 - (b) Evacuating wounded personnel and prisoners.
 - (c) Transporting reinforcements.
 - (d) Positioning additional security elements or blocking forces.
 - (e) Providing on-call illumination.
 - (f) Providing radio relay.
 - (g) Evacuating captured materiel.
 - (h) Withdrawing the raiding party.
 - (i) Providing fire support.
- (j) Providing reconnaissance and surveillance of the objective area during the raid to warn of escaping guerrillas or possible enemy reinforcements.
- (5) After the guerrilla force has been located, it is eliminated, using the technique of encirclement. Army aircraft can assist in this type of operation by—
- (a) Rapid positioning of troops to form the cordon.
 - (b) Providing command control over the operations from an aerial command post.
 - (c) Detecting gaps in the cordon and moving reserves to cover them.
 - (d) Attacking by fire an exfiltrating groups of guerrillas.
 - (e) Coordinating the movement of converging forces.
 - (f) Controlling fire support if artillery and mortars are employed.
 - (g) Providing supply and medical evacuation.
 - (h) Providing night illumination if the operation is not concluded by dark.

Section VI. AVIATION IN SUPPORT OF CBR OPERATIONS

84. General

The aerial mobility provided by Army aviation affords the ground command the increased flexibility needed to conduct operations CBR under conditions. CBR materiel (e.g., weapons and protective equipment) in short supply may be held in central locations and moved to critical areas rapidly and efficiently through use of Army aircraft.

85. Missions

Army aviation CBR missions include—

- a. Transport of all types of CBR agents and munitions, detection devices, and decontaminants.
- b. Aerial radiological survey.
- c. Aerial dispersion of chemical agents (including smoke and riot control agents).

86. Staff Planning and Coordination

- a. Aerial radiological surveys are planned by the chemical officer under the general staff

supervision of the G2 and in coordination with the Army aviation representative. Immediately upon occupying an area and prior to initiating radiological survey, the chemical officer, in coordination with the Army aviation representative, prepares a checkpoint overlay of the area of responsibility. This overlay should be made at division, corps, Army, and logistical command levels. Checkpoints should be from 1 to 2 miles apart and easily recognizable at an altitude of 100 feet.

- b. Immediately after a nuclear burst, an aircraft should be sent out to determine the presence of a crater at ground zero, report the extent of damage, and determine the presence of a radiological hazard. When a radiological survey is ordered, the CBR element will predict the area of fallout and recommend the course legs and the approximate time to fly each leg. Legs are delineated by the checkpoints from the previously prepared check-

point overlay. In addition, the CBR element will obtain monitors to accompany the aviators and ascertain the radio frequency to be used.

c. Other Army aviation CBR missions will be planned by the CBR element in coordination with the Army aviation element. Normally, the supporting chemical unit will provide technical advice and assistance in matters pertaining to the handling of CBR munitions and the decontamination (TM 3-220) of aircraft, when necessary. In the absence of a chemical unit, this assistance will be obtained from the chemical officer of the appropriate command headquarters. The Army aviation element will plan the flight path to the area of release. The CBR element will recommend the best flight path to achieve the desired results over the dispersal area.

87. Crew Hazards

a. *Inflight.* The crew is in danger of contamination when transporting chemical or biological agents and munitions only if a leak occurs. However, because of the difficulty of detecting some of these agents and because there are at present no standard automatic detection devices, crews should wear protective masks to preclude their becoming possible casualties. Protective masks must be worn when chemical and biological agents are disseminated as there is a possibility that contamination will enter the crew compartment.

b. *Ground.* Aircraft returning from CBR missions should be checked for contamination prior to moving into the general parking area. For discussion of decontamination of aircraft and personnel, see FM 1-105 and TM 3-220.

88. Effects on Aircraft

Aircraft are subject to corrosion and pitting by chemical action. To minimize possible damage, aircraft must be decontaminated as soon as possible after delivery of an agent or after an enemy chemical attack.

89. Decontamination and Protective Measures

a. Because of changing wind conditions, several decontamination areas should be designated at all Army airfields and heliports. Aircraft returning from a CBR mission should, if necessary, proceed directly to the decontamination area for inspection and decontamination.

b. Army aircraft are more vulnerable to blast and overpressures than other types of Army equipment. Revetments and natural earth formations furnish aircraft protection from these hazards. Dispersion of units will minimize the number of aircraft exposed to any one nuclear detonation.

c. Protective clothing available to all Army personnel is as effective in the air as on the ground.

d. For further information on CBR protective measures, see FM 21-40 and FM 21-41.

CHAPTER 12

AIRCRAFT PROTECTIVE MEASURES

Section I. ACTIVE DEFENSE

90. General

Defensive measures to protect Army aircraft vary with missions, enemy capabilities, and terrain. The arming of helicopters has given Army aviation an active defense capability. Armed helicopters not only provide a degree of self protection and protection of other aircraft, they may also provide suppressive fires for supported units. While aircraft firepower is recognized as a defensive aid, major reliance is still placed upon artillery support to suppress or neutralize the enemy's capability to fire at aircraft, and upon the aircraft's ability to avoid the enemy by nap-of-the-earth flying techniques.

91. Air Defense Artillery Fire

Air defense missiles will provide protection to Army aircraft operating within the ranges of these missiles by denying use of the airspace to hostile aircraft. The ranges of air defense missiles are such that this protection will extend a considerable distance beyond the FEBA. Communications with air defense units may be accomplished through fire support or air traffic control channels.

92. Field Artillery Fire

Artillery fire directed against ground-fire capabilities can afford significant protection to Army aircraft. Artillery can accomplish specific fire missions against air defense artillery and other targets, and can deliver smoke to cover certain operations.

a. *Suppressive Fires.*

- (1) Observation aircraft are used to direct artillery on-call neutralization fires on *definitely located* active enemy weapons emplacements. Once these emplacements have been rendered inac-

tive, destructive fire is used to eliminate individual pieces. Prompt artillery fire on enemy weapons may force the enemy to adopt more restrictive firing policies against Army aircraft. Specific fire missions in support of rotary wing assault or rescue operations can restrict or prevent movement of enemy troops toward landing areas.

- (2) Flak suppression missions are used to reduce interference with aircraft operating near the frontlines or with airmobile operations extending beyond the FEBA. Fires should be pre-arranged to insure engagement of all known enemy air defense artillery positions. Information on locations of enemy air defense artillery positions may be supplemented by Air Force flak intelligence agencies. Requests for, and coordination of, flak suppression missions are normally conducted through the air-ground communications system. When extensive air cavalry and airmobile operations are to be conducted close to or behind the FEBA, flak suppression missions will be controlled by the appropriate commander. When close air support is used in conjunction with airmobile operations, maximum coordination is necessary for control.
- (a) Suppressive fires require large amounts of ammunition. Such fires are therefore not practical for defense of Army aircraft operating on long-duration missions.
- (b) Suppressive fires are practical for protecting specific short-duration, high-risk combat missions requiring

deviation from normal altitudes or flight paths because of enemy capabilities (e.g., aerial photography, low-level reconnaissance of a particular objective, rotary wing assault operations, and combat rescue missions).

b. Delivery of Smoke. Smoke delivered by artillery or by high performance aircraft is particularly useful in screening operations conducted within range of enemy small arms or indirect fire weapons (e.g., rotary wing rescue, rotary wing assault, combat resupply, and evacuation).

93. Aircraft Cover

a. Army. One Army aircraft may provide protective "cover" to another aircraft directly engaged in mission accomplishment. High-risk missions (low-level reconnaissance and aerial photography) employing aircraft cover defense should be of short duration. In this type of defense, the covering aircraft—

- (1) Protects the other aircraft against ground fire by directing friendly artillery fire in support of the mission.
- (2) Decreases the possibility of surprise enemy air attack.
- (3) Provides a rapid means of initiating aircrew rescue if the protected aircraft is forced down in enemy territory.
- (4) Provides suppressive fire support of aircraft with the same or slower speeds for the duration of flights, or for faster aircraft for short periods.

b. Air Force and Navy. In certain Army operations, Air Force and Navy fighter aircraft can provide fire support against ground tar-

gets. Fighter aircraft also can provide protection for Army aircraft by gaining control of the air and by covering special air missions. This protection can be considerably increased by establishing a direct communications channel between Army aircraft and Air Force control and reporting centers. When attacked by enemy fighters, the Army aviator can call the Air Force control and reporting center in his area and secure prompt fighter aircraft assistance. This procedure is also applicable with airborne tactical air controllers.

- (1) This type of protection is particularly effective where fighter aircraft remain on air alert in support of major operations of ground forces.
- (2) Relatively short-duration missions involving the mass movement of Army aircraft (e.g., rotary wing assault operations or the flight of Army aircraft to a friendly airhead or beachhead) justify the use of fighter aircraft for protection.
- (3) Fighter aircraft may be employed to provide fire support against ground targets in protection of rotary wing assault or rescue operations.

94. Army Aircraft Armament

The Army has several types of armed helicopters with a limited fire support capability. Army helicopters may provide cover for aircraft with the same or slower speeds for the duration of flights or provide protection for faster aircraft for short periods of time. Armed helicopters provide support for use against ground elements and other aircraft with the same flight characteristics. The mission of maintaining air superiority is still the responsibility of the Air Force.

Section II. PASSIVE DEFENSE

95. General

Passive defense employs measures designed to minimize the effect of an enemy attack. It is defined as the defense of a place without the employment of active weapons and without the expectation of taking the initiative. It is based on protection, deception, dispersion, and con-

cealment. In the employment of Army aviation, passive defense includes camouflage, aircraft armor protection, air warnings, route and altitude selection, and electronics countermeasures.

96. Camouflage

Camouflage is one of the simplest but most effective means of passive aircraft defense.

Army aircraft should be painted to present minimum contrast to the surrounding terrain. This will hamper their detection by enemy air, particularly from higher altitudes. Camouflage nets over an aircraft on the ground make detection more difficult. When using nets or other cover for camouflage, care must be exercised to prevent damaging the aircraft. For details on camouflage, see FM 5-20; for details on the use of nets, see TM 5-200.

97. Aircraft Armor Protection

Army aircraft are generally unarmored. As a field expedient, lightweight body armor may be installed on the sides of the crew compartments and on the bottom and back of the seats. This type of armor will generally stop small shrapnel fragments and small arms projectiles.

98. Air Warnings

Timely warning of hostile air activity permits the aviator to take appropriate defensive measures. Air warning broadcasts are disseminated over air warning or emergency channels by flight operations centers in each Corps and Army service area and by flight coordination centers in forward areas. In addition, airfields receive air warnings on established air warning nets. The warnings are retransmitted over tactical channels to in-flight Army aircraft.

99. Route and Altitude Selection

a. Route Selection. Approach, return, and alternate routes beyond the FEBA should be

carefully selected to minimize flight over enemy ground units. A visual reconnaissance of selected routes should be accomplished whenever possible to avoid enemy strongpoints. When a visual reconnaissance has not been accomplished, a detailed analysis should be made of photos and maps of the planned flight route.

b. Altitude Selection. Increased advantages are obtained when aircraft use the low altitude technique in approaching designated landing areas.

100. Electronic Countermeasures

Electronic countermeasures (ECM) may be employed when aircraft are operating within enemy radar nets and within the coverage of electronically directed fire weapons. Successful countermeasures largely depend on accurate knowledge of the locations, types, frequencies, and coverage of enemy radar. Such information is furnished by electronic reconnaissance agencies of the Army and Air Force. The most common electronic countermeasure is to drop metallic chaff to clutter enemy radar—a simple technique. Another countermeasure is the use of an airborne transmitter to jam enemy radar frequencies. Use of the transmitter is effective over long periods but the equipment is heavy and operationally complex. (Except when justified by extensive enemy capability in radar-directed weapons, the airborne transmitter method should not be used.) The current tactical situation dictates the type of electronic countermeasures to be used.

PART FOUR OPERATIONS AND TRAINING

CHAPTER 13 NIGHT OPERATIONS

Section I. GENERAL

101. General

a. Night operations are of particular importance to the commander. During periods of darkness, terrestrial observation is limited, effectiveness of visually-directed defensive fires is reduced, and possibilities of surprise attack are increased. The enemy may be expected to take advantage of the cover of darkness to deploy and redistribute forces and initiate offensive operations.

b. Night operations conducted by Army aviation include surveillance, adjustment of fire, battlefield illumination, night photography, and logistic and service missions. All Army aviation units are organized and equipped to conduct habitual night operations.

102. Advantages

Advantages of Army aviation night combat operations include the following:

a. Night operations by friendly aircraft deny the enemy that freedom of action he would otherwise have under cover of darkness.

b. Many lucrative targets and much intelligence not available in daylight can be secured at night.

c. Greater freedom of action is possible at a time when enemy air defense measures are least effective.

103. Disadvantages

Disadvantages of Army aviation night combat operations are requirements for—

a. Better weather conditions.

b. Better airfields and airfield lighting.

c. Better electronic navigation facilities.

d. Limited use of aircraft caused by reduced visibility.

e. Additional coordination, control, planning, and training.

f. Artificial illumination for external load hookup.

104. Coordination and Planning

The scheduling of night missions must be done far enough in advance to provide time for reconnaissance, detailed planning, and coordination. When feasible, planning should include daylight reconnaissance or study of photographs to avoid congested areas and to select the best routes for navigation. Coordination with the field army flight operations center is necessary to achieve proper control. The Flight Operations Center (FOC) is the agency responsible for furnishing the air defense commander with flight plan data on Army aircraft flights originating in the air defense zones. It is also responsible for insuring coordination with the control and reporting center. Further, coordination must be extended to the lowest echelon concerned because of the difficulty ground troops have in distinguishing friendly from enemy aircraft at night.

105. Training

Training for night missions must be realistic and continuous since it covers a wide scope of proficiency. It must include night landings with marginal facilities and low-level navigation for extended periods of time. This type of training develops the aviator's proficiency in flying and navigation.

Section II. NAVIGATION

106. General

During night operations, aircraft can be navigated by pilotage and/or dead reckoning if the aircrew is sufficiently familiar with the terrain. On dark nights, vehicle traffic moving along supply routes behind the light line or bodies of water may provide adequate reference points for navigation. In addition, searchlights used in battlefield illumination provide excellent checkpoints. If pilotage combined with dead reckoning is an unreliable primary means of navigation, it must be supplemented by radio (electronic) navigation. LF/MF radio beacons, in addition to FM homing stations, are available at the division aviation battalion and the corps and Army aviation company airfields. In all night operations, an alternate airfield equipped with instrument approach facilities should be designated for use when weather conditions preclude return to the departure airfield.

107. Night Orientation

a. Visual. Good atmospheric conditions with some degree of natural light reveal sufficient terrain features to permit accurate orientation without supplemental means. Under other conditions, supplemental means must be used for orientation. White phosphorous or illuminating rounds fired on request from the aviator can be used to mark specific areas. Searchlights provide orientation by beam crossing or direct lighting of a specific area. Radar can be used in vectoring and position fixing of Army aircraft.

b. Electronic. Vectoring is the ground-controlled process of directing an aircraft over a selected course to a predetermined point. When using tracking-type radar, an initial pickup point and altitude should be selected over a visual checkpoint at which the radar can acquire and track the Army aircraft. After pickup, the radar tracks the aircraft, and heading corrections are transmitted to guide the aircraft over the desired ground track. In battlefield illumination, this procedure is used to direct Army aircraft to flare-release points when visual control is inadequate. When dropping successive flares, the aircraft is flown in a

prescribed "race track" or other prearranged course. This procedure is also used to position Army aircraft over points to be photographed when sufficient visual orientation is unavailable.

c. Position Fixing. This is the procedure by which the aircraft position is determined at any given moment. Radar tracks the aircraft and positions are determined on request of the aviator. This procedure is used primarily in night photography to position the aircraft on the photo flight line.

108. Flight Planning

Flight planning for night missions must be more thorough than for comparable daylight missions. Elements of flight planning include obtaining weather information, navigation planning, communications arrangements, arrangements for orientation facilities (if required), and filing of flight plans and altitude clearance. Coordination of Army aviation night operations when air defense units and with Air Force air defense agencies is accomplished by the flight operations center as part of flight clearance procedures. However, coordination with air defense units is normally limited to those units capable of firing on unseen targets by means of nonvisual control. Coordination with visually controlled air defense artillery elements organic to forward ground elements may not be necessary unless required by low-altitude night operations conducted in the immediate vicinity of particular units.

a. Selected flight paths between the airfield and the area of operations should avoid friendly visually controlled air defense elements in forward areas. If this is impossible, a prearranged signal may be used by Army aircraft as a means of revealing their identity to these forward air defense elements.

b. All special communications and orientation arrangements required in night operations should be made prior to takeoff. If flares are to be used, coordination with friendly ground elements must be accomplished to prevent lighting of friendly patrols in forward area ground elements.

c. All aircraft used in night operations should be equipped with basic flight instruments.

d. The use of pyrotechnics requires that stringent safety precautions be prescribed and followed (mountings and settings).

e. Every effort must be made to obtain and

preserve night vision adaptability of aircrews prior to flight. Aircrews who anticipate night flight should wear sunglasses during the day. (Smoking at altitudes above 5,000 feet may reduce night vision as much as 30 percent.) When available, oxygen should be used during night operations.

Section III. BATTLEFIELD ILLUMINATION

109. General

Battlefield illumination is the lighting of the ground combat zone of action by artificial means to provide friendly forces with sufficient light to conduct ground operations at night. Where possible, battlefield illumination should be so employed as to limit its use by the enemy. Army aviation is capable of providing rapid high-intensity battlefield illumination by means of aircraft flares.

110. Capabilities and Limitations

a. Army aircraft are capable of continuous, accurate flare illumination up to 1½ hours per sortie. When conditions permit, flare-loaded aircraft may fly continuous cover for frontlines and deliver on-call illumination. Aircraft flares provide sufficient light for aimed fire, surveillance under conditions approximating daylight, movement of troops and vehicles, minefield operations, evacuation of casualties, and resupply. In addition, flares can be used to silhouette and harass the enemy and discourage infiltration.

b. Aircraft flares temporarily reduce the night vision of friendly troops and create a hazard from falling parts if activated over friendly lines.

111. Techniques of Employment

a. The use of aircraft flares in battlefield illumination should be adequately covered in

standing operating procedures and operations orders to insure coordination, control, and timely availability. Even when on-call illumination is available from aircraft on air alert status, coordination is required to prevent possible exposure of adjacent unit operations. Effective ground control of aircraft must be exercised to achieve accuracy of delivery and to make prompt adjustments in the placing of illumination as required by changes in the ground tactical situation. Alternate means of communications should be planned and coordinated, in the event of failure of the primary means, or in case bad weather or other conditions preclude or limit aircraft operations.

b. Requests for Army aircraft illumination missions are submitted through command channels. Brigade or higher headquarters may assign the mission to Army aircraft, or the request may be forwarded through air support request channels. Approved authority rests with the commander of all units that will be affected by the illumination. The unit requesting illumination will be advised of approval. For ample flare requests, see appendix V. Requests for illumination must be coordinated in the same manner as fire support. As a minimum, items to be coordinated are—

- (1) Control.
- (2) Communications.
- (3) Adjacent unit approval.
- (4) Air defense.

CHAPTER 14

COMMUNICATIONS

Section I. GENERAL

112. General

a. Army aircraft organic to tactical units are equipped with FM radios to net with radios of infantry, armor, and artillery elements. In addition, these aircraft are equipped with UHF radios which will net with supporting Air Force, Navy, and Marine aircraft. The UHF radios also enable communication with air traffic agencies and other elements using UHF equipment.

b. Most aircraft radio equipment is line-of-sight, with reception and transmission over greater distances made possible by higher altitudes. This greater range, however, facilitates hostile monitoring and electronic countermeasures. It also creates the problem of mutual interference with distant ground unit radios operating on the same frequencies; hence, assigned aircraft radio frequencies should be spaced to minimize this interference.

c. Air-ground panels and message drop and pickup may be substituted for radios in air-ground communications when enemy electronic warfare (EW) precludes use of radios.

113. Orders and Instructions

a. Signal Operation Instruction (SOI) are a combat order issued by major commands for the technical coordination of communications within a command. SOI include items subject to frequent change, such as authentication systems, operations and map codes, radio call signs and frequencies, teletypewriter call signs, and visual and sound signals.

b. Standing Signal Instructions (SSI) contain instructions for the use of the SOI. To amplify and supplement Signal Operation Instructions, the SSI also contain the necessary instructions for operating signal communications equipment and agencies.

c. Standing operating procedures (SOP) pertaining to communications are prepared by aviation units based on higher echelon SOP. These instructions govern the routine communications operations of the unit.

d. Paragraph 5 of an operations order contains orders and instructions relative to communications and command posts. It also contains other instructions which include a reference to the signal annex or index to the current SOI, communications restrictions, command post location, and special signal instructions. A signal annex to the operations order may be used to amplify instructions contained in the body of the order.

e. Various Joint Army-Navy-Air Force Publications (JANAP) and Allied Communication Publications (ACP) contain instructions applicable to Army aviation operations including common call signs, emergency call signs, recognition and identification instructions, visual signals, brevity codes, and various communications procedures concerning air navigation. Both publications govern the operation of communications electronic systems in support of joint and combined operations.

114. Duties of the Aviation Unit Communications Officer

The principal duties of the aviation unit communications officer are to—

a. Advise the commander on communications matters and make plans and recommendations for establishing the communications system.

b. Supervise operation and maintenance of the ground and aircraft communications system.

c. Supervise the installation of radio, wire,

and terminal control facilities at the aviation unit instrumented airfield.

d. Coordinate with the local flight operations center and flight coordination center.

e. Supervise the training of communications and maintenance personnel of the communications section.

f. Supervise the maintenance of signal equipment, the employment of codes, authentication systems, and cryptographic operations.

g. Make recommendations for paragraph 5 of operations orders.

h. Prepare orders and procedures, and compile extracts of SOI's and SOP's for aviation missions as needed to insure tactical and technical control of the signal communications system.

i. Assist in selecting the exact location for communications and navigation installations within the airfield complex.

115. Ground-to-Ground Communications

a. Wire.

- (1) Wire or radio relay circuits from the aviation unit to other headquarters and supported units will be provided through the area communications system.
- (2) Wire communications between the aviation unit flight operations section and the flight coordination center is the responsibility of the aviation unit.
- (3) The area communications system will provide circuits from the division flight operations center through the corps flight operations center (FOC) to the army FOC.
- (4) Army aviation units usually have a limited wire capability; therefore, the necessary support for including the unit in the area communications system should be requested from the nearest area signal center.
- (5) A headquarters and headquarters company wire net is illustrated in figure 16.

b. Radio. Organic radio communications equipment of the division aviation battalion en-

ables communications with supported units. Radio communications equipment of other aviation units will be integrated in the existing radio nets of the unit to which assigned or attached. The aviation battalion may operate in, or monitor, the following *division nets* (fig. 17):

- (1) Division command net (FM voice).
- (2) Division warning net (AM voice).
- (3) Division command/operation net (RATT).
- (4) Division administrative/logistical net (RATT). (Enters net as required by temporarily switching radio set from another net.)
- (5) Division intelligence net (RATT).

c. *Messengers*. Early liaison between the aviation unit and the supported unit expedites installation of communications facilities and assures proper coordination between the units. When flight groups occupy airfields before wire communications or proper defense arrangements have been established, messengers should be promptly dispatched to accomplish liaison with the supported unit. Necessary messengers will be included in the advance party occupying an airfield. Messengers may also be employed for liaison with adjacent units in planning and coordinating the local defense plan.

- (1) *Foot messengers*. Foot messengers are used for short-distance communication within or between small tactical units or between elements of an installation such as a command post or an aviation installation. They are especially adapted to use over terrain impassable by motor vehicles.
- (2) *Motor messengers*. Motor messengers are used for greater distances such as between command posts. They are also used for communications between an airstrip and the supported unit command post. For optimum security, motor messengers should operate in pairs.
- (3) *Air messenger*. Air messenger service may be established on a scheduled or unscheduled basis and, in some cases,

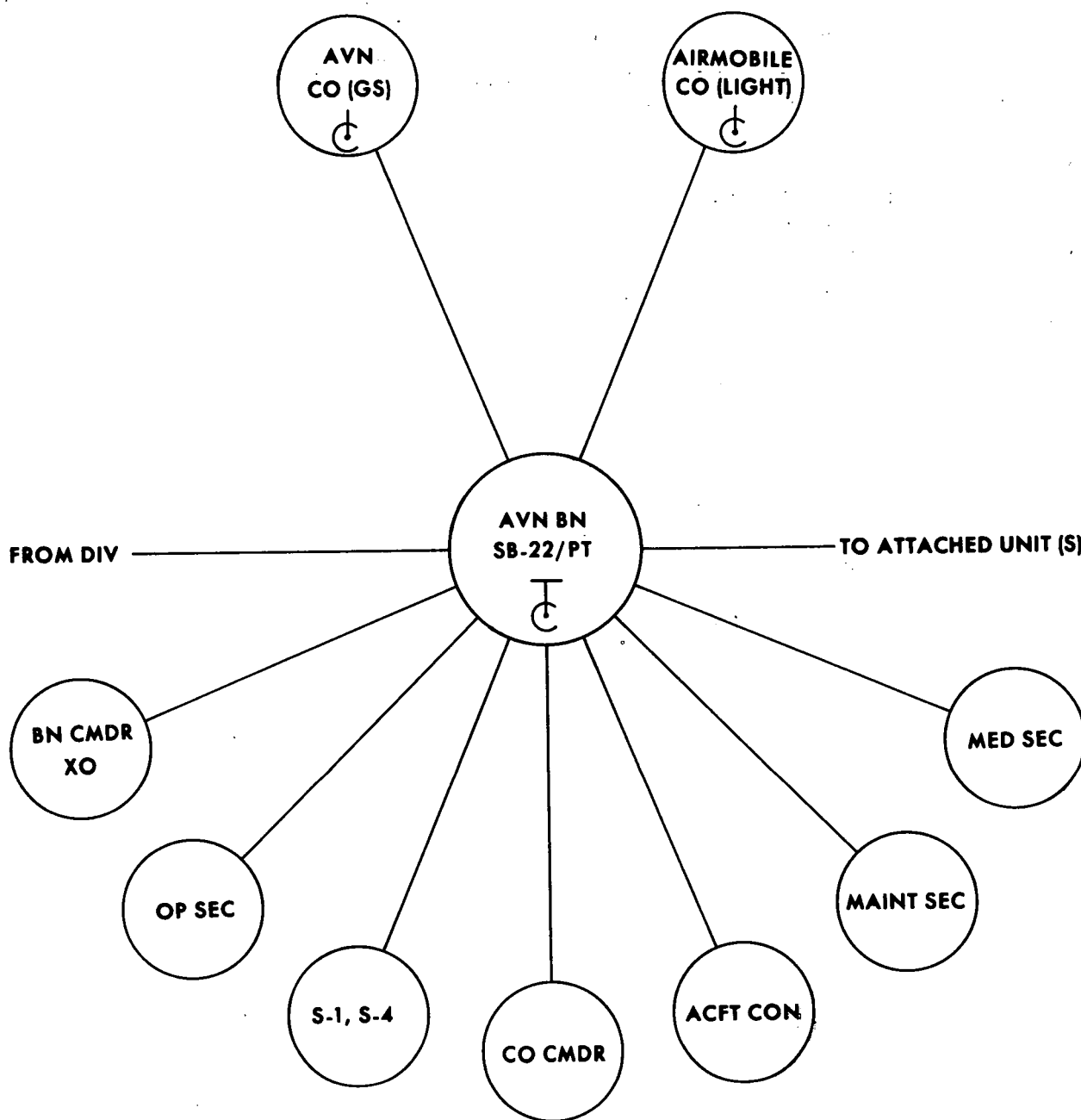


Figure 16. Wire net, headquarters and headquarters company.

may provide an extension to scheduled ground messenger service.

116. Air-to-Ground Communications

a. Radio (FM and AM).

- (1) *Frequency modulation (FM)*. Most air-to-ground radio communication

with the supported unit is conducted with radio sets AN/ARC-44 or AN/ARC-54 in the aircraft and tactical FM radio equipment on the ground. Aircraft flying at low altitudes and long distances from the ground station with which communication is

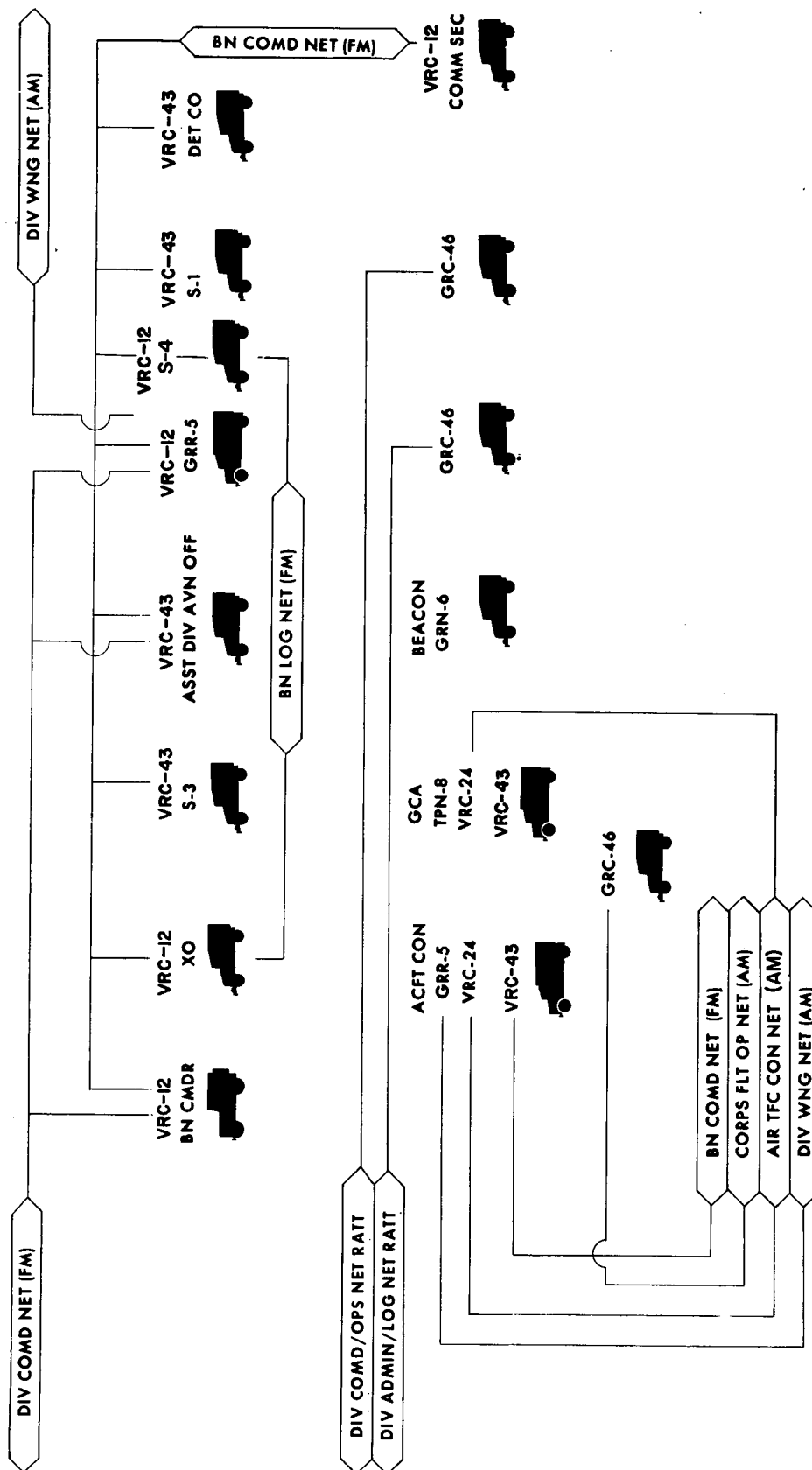


Figure 17. Type radio net, headquarters and headquarters company.

planned may experience line-of-sight restriction common to the *very high frequency (VHF) band in which this tactical FM equipment operates*. In such cases, aircraft at higher altitudes can relay radio messages to those lower altitudes, thereby assuring clear receipt of nuclear warnings or of hostile aircraft approach warnings. A system of radio transmission of warnings should be provided in the aviation unit's standing operating procedures. HF-AM broadcasts by warning stations must be relayed to aircraft by designated VHF-FM ground stations on predesignated frequencies.

- (a) Most FM transmitters operating in the armor, artillery, or infantry radio frequency band can be used by Army aircraft as a source radio wave on which to orient the FM homing device on the AN/ARC-44 or AN/ARC-54 radio sets.
- (b) The FM homing capability can be employed to expedite finding locations for aeromedical evacuation on the battlefield or aerial pickup of troops in enemy rear areas.
- (2) *Amplitude modulation (AM)*. This equipment, operating in the ultra high frequency (UHF) band, is used primarily for air-ground communication with flight operations centers, flight control centers, airfield control towers, and other air traffic control communications facilities; and for air-to-air communications with aircraft of other military services. It can also be employed as a secondary means of air-to-air communications between Army aircraft and air-to-ground tactical communications with Army units having UHF communications capabilities. Air-to-ground communications may be established with downed aviators employing UHF radio sets AN/URC-10. FM and AM frequencies for air-to-ground communications will be specified in ap-

propriate SOI. Radio operating procedure will be in accordance with the provisions of FM 24-18 and ACP 124.

b. *Visual Communications*. Visual communications used by Army aviation elements include pyrotechnic signals, panels, hand and arm signals, aircraft maneuvers and light signals. Visual communications are a supplemental means suitable for transmitting prearranged messages over short distances. However, visual signals are easily misunderstood and are very susceptible to enemy interception and use. The compromise of visual signals must be prevented.

- (1) *Pyrotechnics*. Pyrotechnics, including smoke and flares, are issued in various colors. The meaning of common pyrotechnic signals are included in the SOI. Pyrotechnic signals pertinent to Army aviation are established to identify friendly units or aircraft, to mark targets, to denote aircraft distress, to request scene-of-action radio communication, and to denote significant ground action (ACP 168).
- (2) *Panels*. Panels are used in air-ground communications for marking, identifying, and transmitting messages. Two general types of panels are bright fluorescent-colored panels used for marking and identifying, and black and white panels used on light and dark backgrounds for transmitting messages. If standard signaling panels are not available, improvised material offering good contrast to the background may be used. Panel signals are usually prearranged; however, when transmission cannot be prearranged, the code prescribed in ACP 136 may be used. Standard emergency panel signals are prescribed in JANAP 131.
- (3) *Hand and arm signals*. Hand and arm signals are used in ground handling of Army aircraft (FM 21-6). Standard emergency arm signals for ground-air communications are shown on the back of most sectional aeronautical charts.

(4) *Aircraft maneuvers.* Aircraft maneuvers, such as low passes, rocking of wings, or alternate opening and closing of throttle, are used for limited air-to-ground communications. The use and meaning of such maneuvers are issued as part of the SOI. Also, certain aircraft maneuvers are used for identification and emergency communications to ground radars.

(5) *Light signals.* Signal lamps are used by Army aviation elements to control local traffic in the vicinity of airfields, both in the air and on the ground. The signal lamp is capable of transmitting red, white, or green signals but must be aimed toward the recipient of the message. Standard light signals are prescribed for use in local air traffic control.

(6) *Sonic signals.* The standard sound signals for any type of attack, as well as the all-clear signal, will be used as outlined in the appropriate SOI. For example, three blasts on a horn may be used to signal that an enemy attack is imminent.

c. Message Drop and Pickup. See paragraph 24.

117. Air-to-Air Communications

FM radio (voice) is the primary means of air-to-air communications between Army aircraft; UHF radio (voice) is the secondary means. UHF radio (voice) is the means of air-to-air communications between Army aircraft and aircraft of the other military services. Frequencies for air-to-air communications on FM and UHF will be specified in appropriate SOI.

118. Communications Supply and Maintenance

The importance of reliable communications supply and maintenance support and its effect on Army aviation cannot be over emphasized. FM 1-10 covers maintenance and supply management, supervision, programming, and nec-

essary scheduling. Effective maintenance is dependent upon supply economy, proper requisitioning, and well-supervised scheduling. Types of terrain and climatic conditions in which Army aviation will operate must be evaluated when considering communications maintenance and supply problems.

119. Communications Under Adverse Conditions

a. Radio interference from within or outside the radio set itself must be anticipated. Atmospheric disturbance or static is usually greater on the low to medium frequencies but may not be noticeable on frequencies above 30 megacycles. Manmade interference includes that created by other electrical equipment or enemy countermeasures. Mutual interference can be caused by receiver location, selectivity, or false radiation.

b. Radio sets operating under adverse conditions will require additional maintenance.

(1) In Arctic regions, radio has the advantage of being comparatively mobile. Ionospheric disturbances, however, that affect skywave propagation can cause complete failure of radio communications for varying periods of time, thus occasionally nullifying the advantage of mobility.

(2) The range of radio communications in jungle areas is considerably reduced due to growth of dense high vegetation. In some cases, radio communications may become almost nonexistent. Special precautions are necessary to prevent damage to the radio from heat, moisture, fungi, or insects.

(3) In desert terrain also radio has the advantage of mobility; however, desert terrain provides poor electrical grounds and greatly reduces communications range. Range may be increased by the use of counterpoise in the antenna system.

c. Detailed discussion of operation of radio sets in adverse conditions is contained in FM 24-18.

Section II. COMMUNICATIONS SECURITY

120. General

Communications security measures are designed to prevent or delay acquisition of information of military value from communications sources by unauthorized persons. The three elements of communications security are physical security, crypto security, and transmission security. The maintenance of communications security is a command function. All personnel, particularly those who personally transmit radio messages, must be cognizant of communications security. The commander establishes communications security measures by stating general principles in the unit SOP; by announcing, prior to an operation, the extent to which security is to be practiced; and by making security inspections during an operation. Messages that might compromise the plans, operations, or crypto systems of other units are never transmitted in the clear.

121. Physical Security

Physical security is the physical means taken to prevent capture, loss, unauthorized access, or damage to communications materiel or equipment. SOI extracts carried in Army aircraft pertain only to materiel essential to successful operation of the aircraft. They are prepared so that they can be readily destroyed. When SOI or crypto materials are lost or captured, the facts are reported promptly to the next higher commander. Installations being vacated are inspected for the presence of security material. Unit SOP prescribes emergency destruction of equipment and classified documents to prevent capture and enemy use. Classified material and equipment carried in aircraft will be destroyed if the aircraft is forced down and capture is imminent. If explosive destructors are not on the equipment, destruction can be accomplished by burning the aircraft or by use of grenades.

122. Cryptographic Security

a. General. The definition of encryption is to convert plain text into unintelligible form by means of a cryptosystem. Time spent in encryption gives a high security return. Strict

observance of cryptographic operating instructions is essential to reduce the effectiveness of enemy communications intelligence effort. The use of unauthorized systems is forbidden. Security hazards are minimized by brevity and avoidance of stereotyped phraseology. Identical messages are not sent in clear and coded text or in more than one cryptographic system. When clear text is used, reference to landmarks that can be associated with encrypted map locations are avoided.

b. Cryptographic Security of Aviation Units.

Aviation units use standard cryptographic systems in terrestrial radio communications as appropriate to the level of the net being used. Individual aviation units have prearranged and operational codes on internal communication nets when messages cannot be sent in the clear. A standard prearranged and/or operational code is prescribed for all aviation elements within a field army for traffic control system communications.

123. Transmission Security

a. General. Transmission security limits enemy opportunities to intercept transmissions and prevents his using our communications systems for purposes of deception. Radio is particularly susceptible to interception, position finding, traffic analysis, and deception. A high standard of operator training and net discipline prevents divulging information to the enemy through faulty procedures, and eliminates unnecessary transmission. Adherence to prescribed radio-telephone procedure and authentication systems must be employed to protect radio transmissions.

b. Authentication. The authentication system of tactical air-ground communication is either that of the major command to which the aircraft are organic or that of the unit being supported. In air traffic control communications, a standard authentication system is prescribed for all aviation within a field army. Message authentication is extremely important in aircraft radio relay operations and must be included in all SOI's.

CHAPTER 15

ARMY AIR TRAFFIC REGULATION AND IDENTIFICATION (AATRI)

124. General

Army air traffic regulation is a command responsibility. It is required in the combat zone to coordinate and expedite the safe and orderly flow of Army air traffic under virtually all flight conditions. The Army air traffic regulation and identification (AATRI) company will provide en route air traffic regulation and identification, navigational aids, air warnings, and other assistance to in-flight aircraft (FM 1-5). In addition, it will provide coordination with air traffic of other services and Allied forces as required. The AATRI company will operate under the special staff supervision of the Army aviation officer of the command to which assigned. When coordination with other services is necessary to avoid confusion and duplication, the Army aviation officer at the appropriate headquarters will establish the required liaison.

125. Organization of the AATRI System

a. General. The flight operations centers (FOC) of the AATRI company are the primary operating agencies for the air traffic regulation and identification system. The FOC's are established in each corps area, Army service area, and, if required, in the communications zone. FOC's accomplish the planning, coordination, administration, and communication necessary for continuous operation of the AATRI system (fig. 18). FOC's in the combat zone are normally located adjacent to the Army Air Defense Command Post (AADCP) in the corps and field army areas. All FOC's have a designated zone of responsibility, excluding

airfield control zones, which approximates the AADCP sector of primary interest. Flight Communications Centers (FCC), agencies of the FOC, are established between two division sectors, in the forward corps sector, or elsewhere as required to assist and expedite regulation and identification of air traffic.

b. AATRI Rules. The regulation and identification of air traffic is aided by the implementation of certain air traffic rules as follows:

- (1) *General flight rules.* General flight rules are those that apply to all aircraft under all conditions. These are the normal air traffic rules concerning flight.
- (2) *Visual flight rules (VFR).* Visual flight in combat is considered to mean daytime flight under any conditions of ceiling and visibility which permit flight by reference to the ground.
- (3) *Instrument flight rules (IFR).* Tactical flight under instrument conditions in the AATRI system is interpreted to mean flight under conditions of ceiling and visibility which do not permit flight by reference to the ground, and the operations of aircraft at night within the combat zone.

126. Other Types of Traffic Regulation

To implement AATRI rules, four general types of traffic regulation can be used by Army aviation in the combat zone: route regulation, point-to-point regulation, terminal control (control zone), and forward area regulation (FM 1-60).

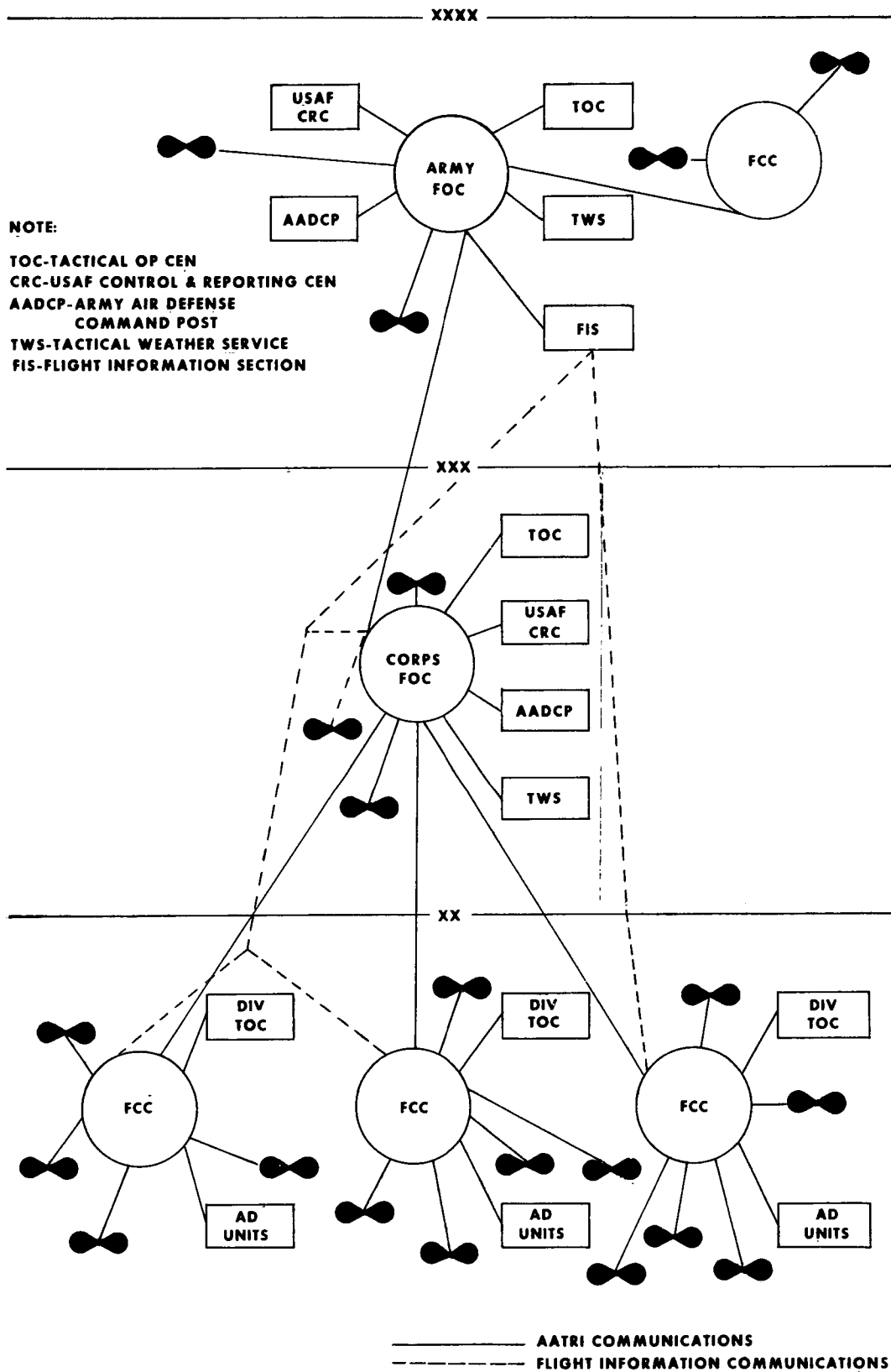


Figure 18. AATRI type system schematic.

CHAPTER 16

AIRFIELDS AND HELIPORTS

Section I. GENERAL

127. General

Army aviation landing areas vary from completely organized and equipped airfields and heliports to strips of terrain or roadway that provide minimum requirements for safe landing and takeoff. The type of landing area to be used will depend on the tactical situation, the terrain, and the time available for preparing ground installations. Detailed discussion of Army airfields and heliports is contained in TM 5-251.

128. Responsibilities and Coordination

a. Responsibilities of Aviation Units. Selection and development of an airfield or heliport is the responsibility of the aviation unit commander. He selects the airfield or heliport from areas allocated for this purpose. The field should be located in close proximity to the supported unit. Coordination should be accomplished to take maximum advantage of area security and available communications facilities. The Corps of Engineers is responsible for constructing Army airfields and heliports in a theater of operations. When the necessary engineer support is not available, units will be required to develop their own airfields. While each aviation unit usually has its own airfields, it may be necessary and justifiable for two or more units to share a common site when economy of personnel and effort so dictates; when local security problems exist; when plans for aircraft employment lend themselves to common airfield use; or when there is a shortage of suitable airfield sites. A common airfield is undesirable in areas where nuclear weapons are present or their use is anticipated. The decision to use a common airfield should be made by commanders controlling all aviation units concerned.

b. Responsibilities of Units Without Organic Aviation. Units which do not have, but require, organic aviation support are responsible for the selection and development of necessary airfields or heliports. Location and suitability of landing areas and facilities, including their security while in use, must be coordinated with all aviation units concerned. Engineer support must be requested by units responsible for the landing areas.

c. Maintenance. Minor maintenance of Army airfields will be performed by the unit using the installation. The unit's organic maintenance capability will be used. Major maintenance, such as the correction of safety hazards beyond the organic maintenance capability of the unit operating the airfield, will be performed by engineer troops.

129. Classes

Army airfields or heliports are divided into three general classes based on standards of construction: *Pioneer*, *hasty*, and *deliberate*. These are discussed in detail in TM 5-251.

130. Army Airfields and Heliports (Types)

Army airfields and heliports are further divided into specified types relative to employment. Each division, corps, and Army unit will normally operate an airfield which will be lighted, possess instrument facilities, house a third echelon maintenance organization, and provide POL to service any Army aircraft. These airfields will be operated by the division aviation battalion, corps aviation company, and Army aviation company respectively. Units with organic aircraft, other than those mentioned, will maintain airfields or heliports as required. These airfields or heliports will have minimum lighting facilities and POL and main-

tenance support for the aircraft assigned. Those units which have a requirement for dispersion of aircraft, reduction of air traffic, decrease of ground congestion, or any combination of the above, may operate satellite airfields or heliports. These airfields and heliports

must have the necessary facilities to support aircraft operating from them. Units which have no organic aircraft but may require aviation support will normally maintain a supported unit airfield or heliport comprising landing and takeoff areas only.

Section II. SELECTION

131. Reconnaissance

Reconnaissance for airfield or heliport locations is best accomplished by means of map, aerial, and ground survey. It is important that unit commanders and aviation officers, as well as engineer officers, understand the factors involved in site selection, since they may frequently be required to make a reconnaissance for site selection. The types of airfield or heliport reconnaissance are map, aerial, and ground (TM 5-251).

132. Factors Affecting Selection

Because of the demands upon engineer support, all factors in site selection must be carefully considered in order to minimize the amount of engineer assistance required. There must be close coordination between the unit engineer and the aviation officer. Criteria for selecting aviation battalion airfields and heliports are generally the same. Satellite airfields and heliports require less area and fewer facilities than the larger fields (TM 5-251).

Section III. ORGANIZATION, PLANNING, OCCUPATION, AND DISPLACEMENT

133. General

The time and method of occupying a new airfield or heliport will depend upon the tactical situation, communications with the supported unit, and ground conditions. When extensive preparation of the new site is required, the aviation unit commander may have to augment the ground reconnaissance party or obtain engineer support. Because of the necessity to maintain continual support during a move, extensive planning must be accomplished.

134. Organizational Planning

Organizational planning for occupying an Army airfield or heliport begins with the selection of the field (pars. 131 and 132). The parties to make both aerial and ground reconnaissance, the method of travel, the number of vehicles or aircraft, and the equipment necessary must be designated. Each member of the reconnaissance party is assigned a particular task to facilitate rapid reconnaissance of the area. The unit commander will normally lead the party and, after his initial reconnaissance, will point out the areas to be occupied by each section. Each member of the party will then plan the occupation of his particular area.

After completing the initial reconnaissance, the party will assemble and discuss the detailed plan of occupation. The unit SOP should contain as much of the above information as possible, to expedite planning and organization of the position.

a. Layout of Airfield. Figure 19 illustrates a sample layout for an Army airfield. Each of the areas selected by the unit commander and reconnoitered by the reconnaissance party are discussed below.

- (1) *Aircraft parking area.* Dispersed and concealed parking areas must be so located as to permit minimum ground handling of aircraft with maximum concealment of ground tracks. A parking area for visiting aircraft should be selected near the operations center.
- (2) *Refueling facilities.* The method of refueling aircraft will be determined by the type of refueling facilities available to the unit. It is generally preferable to carry fuel to the aircraft than to taxi the aircraft to the fuel source. POL supplies should be dispersed, sheltered, and concealed.

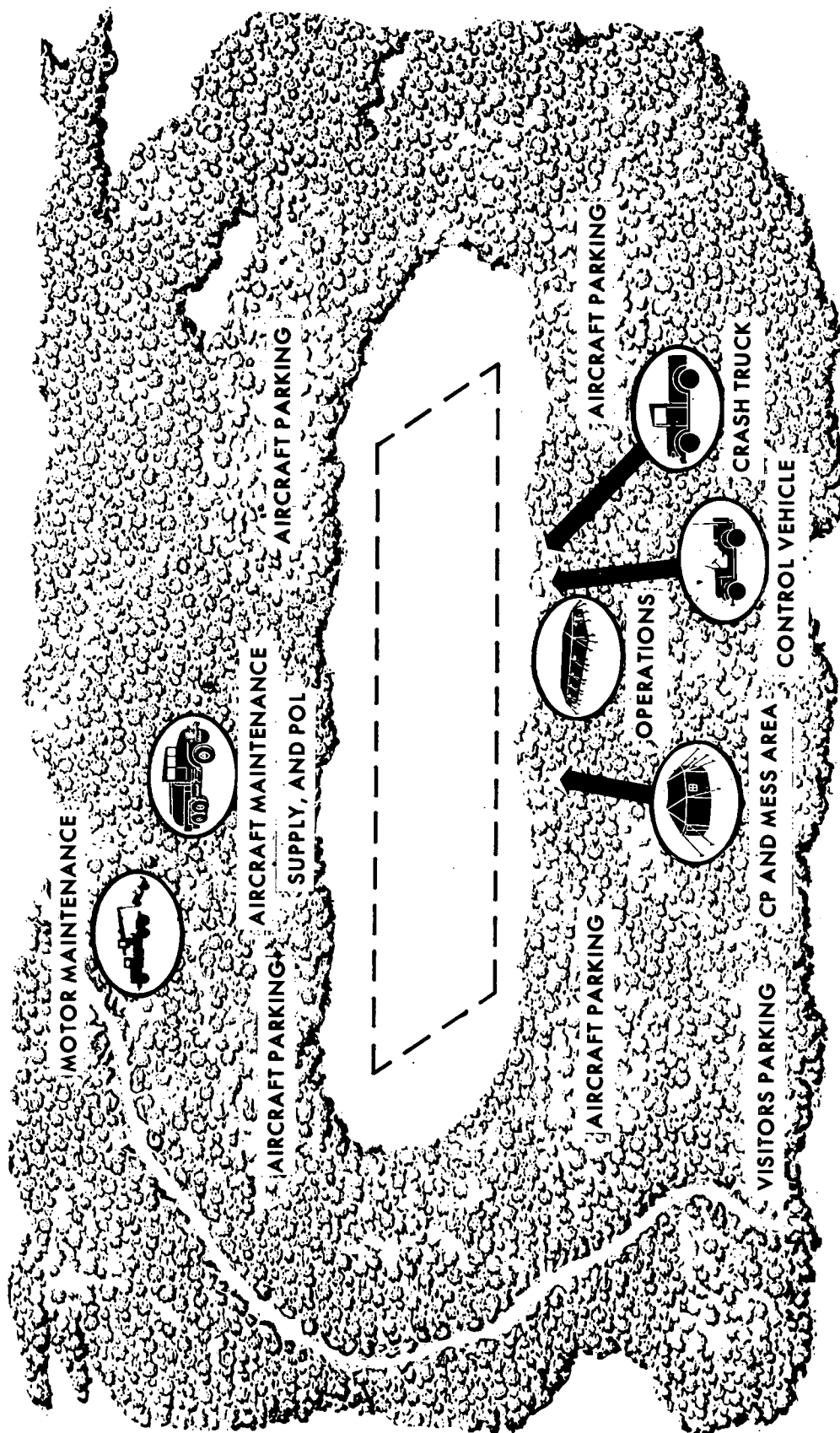


Figure 19. Sample layout of an Army airfield.

- (3) *Operations center.* The operations center includes facilities necessary for proper control of all unit aviation operations: files, records, publications, maps, telephone and radio communication with the supported unit command post, and radio facilities for communication with aircraft in flight. The operations center should be located so that wire communications lines will not cross the landing areas. It should be readily accessible to individuals arriving at the field by aircraft or vehicle.
- (4) *Motor park.* The motor park should be located in the area that permits dispersion and concealment of vehicles and easy access to other aviation installations.
- (5) *Command post and mess area.* The command post and mess area should be centrally located where it will not interfere with operations, yet will be easily accessible. The area should be large enough to accommodate all administrative installations and afford dispersion and concealment.
- (6) *Maintenance area.* The aircraft maintenance area should be accessible to aircraft and vehicles and afford adequate space and concealment. Aircraft undergo minor maintenance in the parking area; they are moved into the maintenance area for organizational maintenance.
- (7) *Markings.* To enable aviators to become familiar with a new airfield, panels should indicate landing directions and usable limits of the landing area. Standard airfield and helicopter markings are contained in FM 21-60. Panels are easily seen by the enemy and should be removed as soon as practicable. If panels are not available, personnel of the aviation unit should mark usable limits with flags, flares, smoke pots, or other appropriate markings. Panel markings may be required for transient aircraft. In addition to marking the wind direction and the usable landing area, all

obstructions should be plainly marked (i.e., wires, chuck holes, snowbanks etc.). This is especially necessary when a field is covered with snow.

b. Planning the Movement. The following must be considered in planning the occupation of the airfield or heliport:

- (1) Routes of march.
- (2) Marking of routes.
- (3) Number of vehicles in each serial and number of serials.
- (4) Time of march.
- (5) Coordination of road space.
- (6) Methods of moving aircraft.
- (7) Transportation of personnel and equipment.
- (8) Continuity of operations.
- (9) Security during displacement, road march, and occupation.

135. Occupation

Two types of occupation apply to both daylight and nighttime occupation: *hasty* and *deliberate*. The unit SOP should contain information on detailed duties of all personnel in both types.

a. Daylight.

- (1) *Hasty.* When hasty occupation of an airfield or heliport is necessary, reconnaissance of the intended area is made from the air while the main body of the unit is en route. The field can be selected and a landing made. When the intended use of the field has been determined feasible, the en route unit is advised. Personnel aboard the reconnaissance aircraft organize the area and, upon arrival of the main body, point out the locations for the various elements. It may be necessary that the aviator of the reconnaissance aircraft direct the unit, or he can act as the controller to land other aircraft.
- (2) *Deliberate.* Deliberate occupation of an airfield or heliport is preferable whenever possible. In this type of occupation, the area will have been selected by previous reconnaissance, the field marked, and guides made

available to direct the aircraft and vehicles to their assigned areas. When complete planning has been accomplished, the occupation can be conducted rapidly and with minimum confusion.

b. Nighttime.

- (1) *Hasty.* Hasty occupation as discussed in *a* above is not feasible at night.
- (2) *Deliberate.* Deliberate occupation of an airfield or heliport at night requires the presence of more personnel in the area prior to the arrival of the main body than during the day. One representative from each section is required to lead that section to its assigned area and also to lead the vehicles to their parking areas. No vehicles should move at night without a guide. To prevent delay at the entrance to the field or heliport, all guides must be familiar with the area and meet the vehicles upon their arrival. The aircraft should not be brought into the field until the main

body has closed. The airfield or heliport lights must be in place and the field or heliport checked for usability prior to darkness. Wire communications should be operational and, if possible, the operations tent or vehicle should be in position.

136. Displacement

As soon as practicable after a new airfield or heliport is occupied, additional fields should be reconnoitered for future occupation, and an alternate field should be selected. The reconnaissance for new airfields or heliports is a continuous requirement. When displacing, continuity of operations must be maintained. The rear area should provide POL support and maintain operations, control, communications, limited maintenance facilities, and a security element. Rear area operations should displace when the forward area is completely operational and has control of all aircraft. Missions initiated during or after displacement should terminate, to the extent practicable, at the new field.

Section IV. SKI AND FLOAT PLANE FACILITIES

137. General

Army aircraft may be equipped with skis or floats for snow or water operations. Operations on snow are required during the winter months in many areas and at all times in some areas. The use of water areas for Army aviation operations is advantageous in that a minimum expenditure of construction time and effort is required to prepare the landing surface, and there is less likelihood that the landing and takeoff area will be damaged or destroyed by enemy action. An obvious limitation is that a suitable water area may not be available in the location desired; however, in most locations, water areas such as rivers, lakes, seas, oceans, reservoirs, and canals are available within a reasonable distance of almost any ground location. Details on ski and float operations are presented in TM 1-235.

138. Site Selection

a. Ski Plane Operational Areas. An aircraft on skis requires a larger operating area than

conventional aircraft. Longer and wider fields are required because runup must be made while taxiing. Turning will require more area and, in most cases, the ground roll will be longer.

b. Water Area.

- (1) *Size.* An Army seaplane facility must be large enough to accommodate every type of aircraft expected to use it. Recommended minimum dimensions of the water area are a length of 2,500 feet and a width of 200 feet. The minimum depth of the water should be 4 feet.
- (2) *Currents and water level variations.*
 - (a) Currents affect size requirements of the water landing area only under extraordinary conditions. Landing and takeoff operations can be conducted in water currents with a flow rate in excess of 6 knots (7 mph), but taxiing operations be-

between water lanes and shore facilities in such currents will require the assistance of a surface craft.

- (b) Generally, where the change in water level exceeds 18 inches, floating structures or moderately inclined beaching accommodations will be required to facilitate handling of aircraft at a shoreline or waterfront. Where water level variations exceed 8 feet, special constructions will be required to facilitate aircraft accommodations.
- (3) *Water surface conditions.* Open or unprotected water may become too rough under certain conditions to continue operations. Although the average Army aircraft equipped with floats can be safely operated in rough water measuring from 15 to 18 inches from crest to trough, crests of 18 inches or more will restrict normal safe operation.
- (4) *Bottom conditions.* Reservoirs and other artificial bodies of water are often located in natural land areas where stumps and logs were not removed before flooding. In such areas, the anchors and anchor lines may foul, and, over a period of time, create a hazard if the submerged objects rise to the surface or remain partially submerged.
- (5) *Sheltered anchorage areas.* Sheltered anchorage areas will be required where sudden or unexpected storms or squalls are likely. The anchorage area must be easily accessible from the onshore area, and must be located to permit unrestricted maneuvering of the aircraft when approaching the buoys.

c. Shoreline Installation. Detailed discussion on shoreline installation selection is contained in paragraph 139b.

139. Design and Layout

a. Water Operating Area. Many natural areas will provide the required dimensions for

seaplane operations without modification. Where the available water area is limited, the minimum water operating area must consist of a water lane for landings and takeoffs and a channel for taxiing. A turning basin will be necessary when turning must be confined to a restricted area because of water depth requirements or other considerations. In some cases, anchorage areas will be necessary.

- (1) *Water lanes.* Approach zones, currents, and direction of the prevailing wind must be considered in determining the direction of the water lane. When single-line operating areas cannot be oriented to take maximum advantage of the prevailing winds, the water lane may be shifted to use the greatest possible wind coverage in conjunction with water currents and approach zone requirements. A typical layout for a single water lane operating area is shown in figure 20.
- (2) *Taxi channel.* Minimum width of the taxi channel should be 125 feet; however, a width of 150 feet (or more) is preferred. Taxi channels should provide direct access to the onshore facilities and, when possible, should be oriented so that approach to the ramp or float will be into the prevailing wind.
- (3) *Turning basins.* Turning basins will be required where the use of the water area is restricted. A minimum radius of 125 feet should be available for surface turns.
- (4) *Anchorage areas.* Where anchorage areas are provided, they should be furnished with maximum possible protection from high winds and rough water and should be positioned so that each aircraft can swing around its mooring while anchored. The space needed is determined by wing-span and length of aircraft, length of line and bridle, and lowest water level.

b. Shoreline Areas. Shoreline installations are partly on land and partly in the water. They perform two general types of facilities: servicing, loading and unloading, handling, and

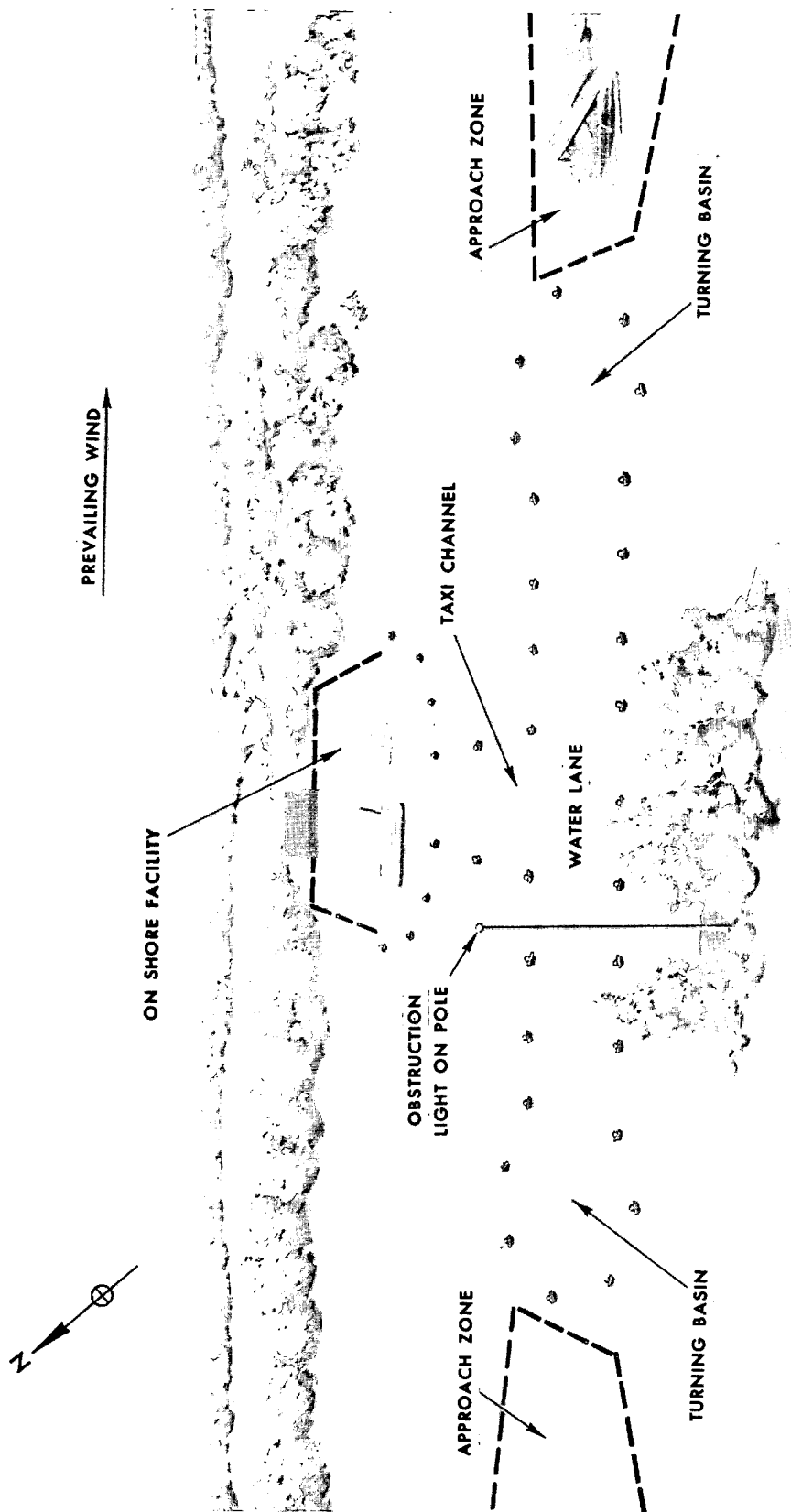


Figure 20. Single water lane operating area.

tieup facilities for seaplanes in the water; and haul-out facilities for removing seaplanes from the water.

- (1) *Ramps.* Slope for ramps should not be steeper than 7 to 1. For most Army aircraft equipped as seaplanes, a ramp with a depth of 18 inches is adequate; a depth of 3 feet should be adequate in all cases. The recommended ramp width is 20 feet; the recommended minimum width is 15 feet. All spikes, nails, and bolts used in the construction of the ramp should be counter-sunk to avoid damage to floats or tires.
- (2) *Piers.* Piers or fixed overwater structures can be used where the variation

in water level is 18 inches or less. The pier should extend into the water to a point where the water depth is adequate for the types of aircraft to be handled.

- (3) *Slipways.* In deliberate construction, slipways (fig. 21) can be provided for anchoring and protecting individual aircraft. The principal requirement for this type of installation is that it be located where the change in water level is not more than 2 feet and the minimum depth of water is 2 feet. A gate should be provided to reduce wave action, and some form of bumper protection, such as old



Figure 21. Slipway.

vehicle tires, should be attached to the inside of the rear wall, sides, and gate to prevent damage to aircraft floats.

- (4) *Floats.* Floats offer the greatest flexibility in provision of docking facilities since they ride with wave actions and

are satisfactory in areas of great or negligible water level variations.

- c. *Snow-Covered Areas.* In snow-covered areas, additional space is required for taxiways and runways. The layout is otherwise the same as that for a normal airfield or heliport.

Section V. LIGHTING

140. General

a. Army fixed wing aircraft will seldom operate at night from fields in forward areas, since lighting facilities required for safe take-off and landing may reveal the position of the airfield to the enemy. Rotary wing aircraft, however, may operate from forward areas provided with a single shielded light or a landing device to project a beam at a preset angle.

b. Airfields and heliports located in other than forward areas may use lighting systems that range from permanent lighting to simple field expedients.

141. Methods of Lighting

a. *Permanent Lighting Systems.* Permanent lighting systems include runway lights, lights for taxiways, obstruction lights, and usually some type of rotating beacon. When a field has reached the deliberate stage, a permanent lighting system may be installed. Further discussion of lighting systems is contained in TM 5-251.

b. *Army Airfield Lighting Systems.*

- (1) The light set, operational area, aircraft, 1½ kw, airfield runway, authorized in unit tables of organization and equipment (TOE), is designed for combat use. It can be used on a hasty- or deliberate-type airfield and normally is found in division or higher echelon units only. From 30 to 45 minutes are required for a well-trained crew to install or remove this set. For this reason, it is not desirable to use this equipment in fast-moving situations unless a large number of night missions are anticipated. Its main advantage is that it can be quickly turned on or off.

- (2) The light set used as an emergency airfield runway marker is portable and battery operated. This set will normally be used in fast-moving operations when only a small amount of night traffic is anticipated. It can be emplaced or recovered rapidly, but each light must be turned on and off individually.

c. *Heliport Lighting System.*

- (1) The light set, operational area, aircraft ½ kw, heliport, authorized in unit TOE's is designed for combat use. It can be used on a hasty- or deliberate-type heliport and normally is found in division or higher echelon units only. This set can be quickly emplaced or recovered and can be turned on or off quickly.
- (2) Most units with small numbers of organic helicopters have the light set, marker, emergency airfield runway, portable, battery operated, which is effective but has the limitation mentioned in b (2) above.

d. *Water Area Lighting.* Lighting for water areas must be similar to that of Army airfields and heliports. Such lighting is most frequently associated with semipermanent and permanent facilities. One of the simplest methods of lighting is to install portable, locally operated lights on suitable buoys or floatation gear anchored in position. The light set, marker, emergency airfield runway, portable, battery operated, is ideal for this type installation. Seaplane facilities intended for use at night should normally be provided with one or more of the three types of lighting defined below:

- (1) *Double-row lighting*, which consists of two lines of channel lights and associated threshold lights for defining the

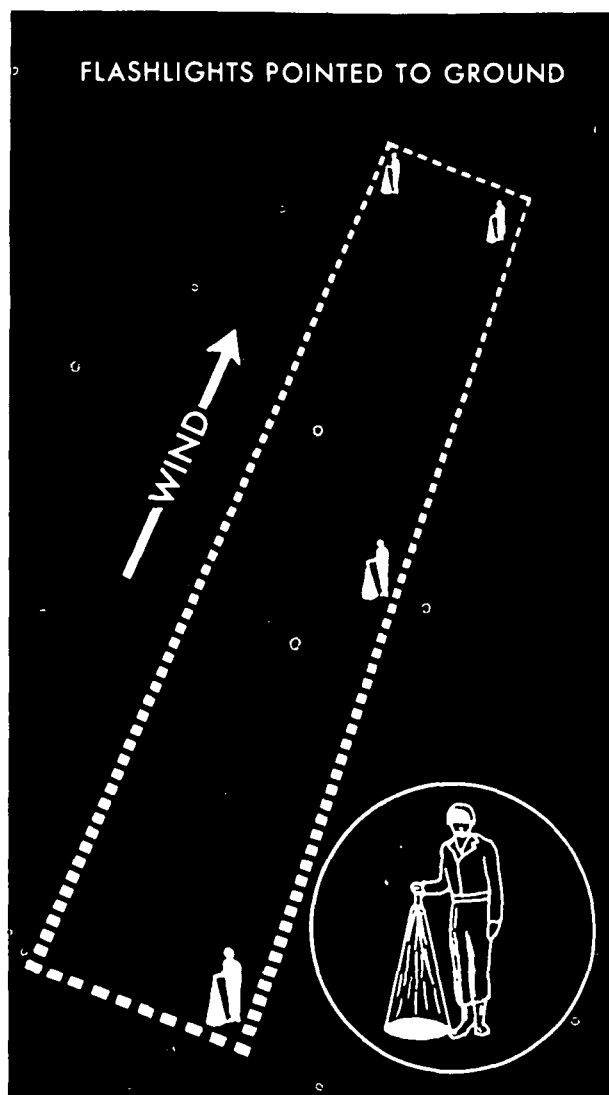
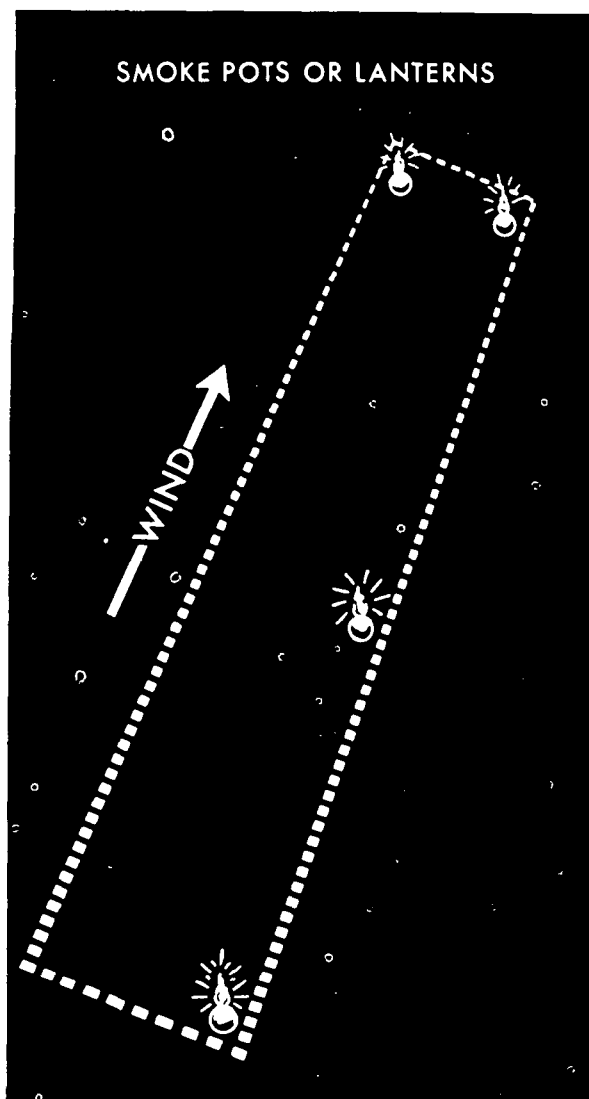


Figure 22. Minimum lighting expedients.

area intended for the landing and takeoff run of the aircraft.

- (2) *Single-row lighting*, which consists of a single line of lights and associated threshold lights for indicating the preferred location and direction for the landing and takeoff run of aircraft.
- (3) *Boundary lighting*, which consists of boundary lights and range lights that define the limits of the safe landing and takeoff area.

e. Expedients. Expedients may be used for lighting if issue equipment is not available. Lanterns, smudge pots, vehicle headlights, or reflectors may be used to delineate the runway edges. Figure 22 shows two suggested methods of employing minimum lighting expedients for night landings. Appendix VI contains a description of a helicopter night-landing system that is lightweight, portable, simple to operate, economical, and suitable for auxiliary strips and for pathfinder work.

Section VI. SECURITY

142. General

The local security of an airfield or heliport is the responsibility of the commander of the aviation unit occupying the field. If more than one unit uses the same field, the senior commander will be responsible. The local plan must be coordinated with those of adjacent units and higher headquarters for tie-in with the area defense plan. Local security of satellite airfields and heliports is the responsibility of the aviation officer in charge. Area security must be provided by the supported unit. Limited organic firepower and personnel will require extensive use of passive defense measures for airfields and heliports, including mobile evacuation of the unit.

143. Active Defense

a. Timely and accurate air warnings of hostile air activity is a primary means of aircraft defense. If the in-flight aviator receives air warnings in time, he can undertake appropriate defensive measures before attack. Air warning broadcasts are made by flight operations centers in each corps and army service area. All airfields are equipped to receive air warnings on established air defense artillery (ADA) intelligence nets. An emergency radio channel is allotted for air warning reception by Army aircraft possessing required radio equipment. Aircraft not equipped with this radio equipment will receive warnings from flight operations over tactical channels. Information on air alerts, CBR attack, fallout, nuclear strikes, and similar information of an urgent operational nature that would apply to all friendly units will be transmitted over a warning net (division, corps, or army).

b. Air defense artillery units or detachments may be used at or near airfields when available and when the tactical situation warrants.

c. Aviation unit enlisted personnel are trained to fight as infantrymen; however, because of the nature of the aviation operation and small number of personnel available, they must be augmented to provide a suitable perimeter defense.

144. Passive Defense

Passive defense is the primary method of protecting an airfield. All available airfields will be used to assure adequacy of aircraft dispersion against nuclear weapons fire. Air movements must be scheduled to prevent aircraft concentrations at one site. The aviation unit commander or the unit aviation officer is responsible for implementing passive defense measures to include training of aviation unit personnel in interrelated aspects of discipline, camouflage concealment, dispersion, and first aid. Shelters will be dug or constructed for personnel, supplies, and aircraft. The guiding theme for successful passive defense should be dispersion of personnel and equipment.

a. The airfield site should provide maximum cover and concealment, including defilade where practicable; and all aircraft should be camouflage painted.

b. Details of carefully formulated and executed camouflage plans, with suggestions for continuous inspection and improvement, can be found in FM 5-20. Personnel must be trained to maintain camouflage discipline at all times.

c. Extent of dispersion is influenced by the ability to perform assigned missions and provide cover, concealment, and local defense.

d. Deception techniques are used to the maximum degree practicable. Depending upon enemy aggressiveness and capabilities, it may be necessary to construct one or more dummy airfields that must be realistic enough to be mistaken as an actual airfield. The purpose of dummy airfields is to attract attention of enemy elements searching the area for a suspected airfield.

e. When there is inadequate defilade of the airfield, aviators should employ the *contour approach* technique. Contour approach is accomplished by descending to the lowest possible altitude at some distance from the actual field (possibly over a dummy airfield), and approaching the field by a low-level route, taking advantage of all existing cover and concealment. A similar roundabout course is taken after takeoff and departure from the field.

f. Alternate airfields are established, improved, and developed as practicable for immediate occupancy in case the primary field becomes untenable.

g. The aviation commander is responsible for defensive training of his unit and for preparing an adequate SOP against CBR attack (FM 21-40).

Section VII. CRASH-RESCUE AND FIRE-FIGHTING

145. General

Crash-rescue personnel must be prepared for immediate and effective action to neutralize all potential dangers which may result from aircraft accidents. Personnel must understand the nature of all types of fires and the most effective extinguishing agents. SR 95-50-1 contains a complete discussion of basic preparatory measures, duties, and operating procedures essential to activating all emergency crash-rescue, firefighting, and other rescue services and associated activities.

146. Responsibilities and Coordination

The aviation unit commander, or unit aviation officer when appropriate, is responsible for equipping, organizing, and training crash-rescue teams within his unit. He will prepare a crash-rescue plan for the airfield and insure that it is understood by each individual required to participate in crash-rescue and firefighting. Coordination must be accomplished with other users of the field or heliport, with unit engineers, with third echelon maintenance support activities, and with supporting medical service units.

147. Crash-Rescue Plan

This plan is part of the preaccident plan (app. VIII) and should contain the following:

- a. Responsibilities and duties of all concerned.
- b. Training requirements.
- c. Organization.
- d. Communications system.
- e. Procedures as to notification and actions of all concerned.

148. Equipment Requirements

It is necessary at times to improve and augment TOE-authorized equipment for use by unit crash-rescue teams. The following items

are listed as an equipment guide for unit commanders:

- a. Vehicle (1/4-ton or 3/4-ton) (TOE).
- b. First aid kit (TOE).
- c. Firefighting equipment set, truck mounted, Army aircraft (TOE). SM 5-4210-203-10 contains list of items in this set. Units that do not have this set as a TOE line item should improvise a kit as required for their operations.
- d. Fire extinguishing agents.
 - (1) Monobromotrifluoromethane (aircraft).
 - (2) Foam and CO₂ extinguishers (Engineer equipment).
 - (3) Blankets, vehicles tops, tarpaulins (salvage).
- e. Emergency communications system or warning device (TOE and salvage).

149. Training for Crash-Rescue and Firefighting

A sustained training program will be initiated by the aviation unit commander or the aviation officer, as applicable, to establish and maintain a high degree of unit proficiency in crash-rescue and firefighting. Installation fire marshals or local engineer units and medical facilities will provide technical assistance. If operational requirements permit, on-the-job training can be arranged to insure adequate training of personnel. To provide flexibility of operation, each person should be trained to fulfill the duties of another member of the crash-rescue team; however, certain key persons should be specially trained for duty on a crash-rescue team. These specialists and the scope of their training are listed below:

- a. *Firefighting Specialists.*
 - (1) Characteristics and effects of class fires.
 - (2) Characteristics and effects of extinguishing agents.

- (3) Selection and application of extinguishing agents.

b. Airframe Specialists.

- (1) Electrical systems of all Army aircraft.
- (2) Fuel systems of all Army aircraft.
- (3) Cutaway points of all Army aircraft airframes.

c. First Aid Specialists.

- (1) Practical application of immediate first aid.
- (2) Treatment of burns, cuts, and abrasions.
- (3) Splinting of broken limbs.
- (4) Manual movement of the injured.

CHAPTER 17

TRAINING

Section I. GENERAL

150. Responsibilities and Coordination

a. General. Technological developments and new operational and organizational concepts portend increased emphasis on the employment of Army aviation in future combat operations. The organizational structures and missions of Army aviation units require decentralized operations; therefore, these units will seldom, if ever, operate in a tactical situation completely intact. This creates a training requirement made more complex by the number of specialized personnel in aviation units. Commanders of aviation units must therefore prepare and implement a flexible training program that will function under these complex conditions without impairing the operational support capability of the unit.

b. Command Responsibility. The commander is responsible for the training of his unit. He also establishes the proper priorities of training in relation to performance of operational missions. The quality and thoroughness of training are directly proportionate to the amount of active and personal supervision rendered by commanders. Continuous observation of training is necessary to determine how well training objectives are being accomplished. Inspections must be followed by constructive criticism designed to achieve and maintain a high standard of training. In this process, commanders should respect and use the chain of command.

c. Aviation Staff Officer Responsibility. The aviation staff officer assists the establishing master training schedules, technical training programs, and unit schools. He supervises the aviation training of all units in the command. He coordinates with all other members of the staff to obtain required support and to combine aviation and ground unit training.

151. Training Objective

The objective of Army aviation training is to train individuals and units toward the development of flexibility in operations and employment. To achieve this objective, balanced training in *tactical, technical, and logistical* operations of Army aviation is essential. The proper relationship between these operations must be maintained throughout the training cycle. In purely combat support aviation units, the greater proportion of training must be devoted to tactical training, but sufficient instruction and practice must be included to insure proficiency in technical subjects and logistical procedures. Formal instruction outlined in Army training programs (ATP's) should be followed and augmented by concurrent and integrated training to obtain an appropriate balance.

152. Planning

Training subjects and hours are outlined in appropriate Army training programs, subject schedules, and directives from higher headquarters. However, to achieve the maximum benefits from the training time available, a flexible, well-organized training plan is required. No ATP's are available for some small aviation sections; therefore, for necessary references, applicable portions from ATP's of similar larger units should be extracted.

a. When planning a weekly training schedule, the operations officer should take advantage of all required missions and derive as much training from them as possible.

b. Extensive coordination must be accomplished with section leaders within a unit to identify and correct the particular shortcomings of their respective sections.

c. Maintenance problems may be solved by combining proper scheduling of training with actual performance.

d. The overall training plan must provide for specialists' needs and for their formal school training. It must also provide unit school and on-the-job training.

e. To maintain aviator proficiency in all types of flying, adequate flying time must be planned. Also, training schedules must be prepared for aviators on ground duty within the command. All flights should be planned to derive as much training as possible (e.g., on cross-country flights, simulated instrument flight should be performed with practice instrument approaches, providing this does not inter-

fere with the mission or the passenger's comfort).

f. The following references may be used as guidance in overall planning:

- (1) Appropriate unit TOE.
- (2) Appropriate Army training programs, Army subject schedules, and Army training tests (DA Pam 310-3).
- (3) Field manuals of the 1-series, FM 21-5, FM 21-6, and other appropriate field manuals and training circulars.
- (4) Appropriate technical manuals and technical bulletins.
- (5) DA Pamphlet 108-1.

Section II. INDIVIDUAL TRAINING

153. Officer

Aviation units contain a greater ratio of officers to enlisted men than nonaviation units. Besides being aviators, aviation unit officers must be equally proficient as ground officers. Therefore, aviators assigned to combat support aviation units need training in both ground and aviation tactics. This will enable aviators to understand the missions of the supported unit and provide more efficient support. Overall coordination will be more effective and the aviator will become better qualified to assume the duties of higher commanders.

a. Even though his assigned duty is limited primarily to flying, the aviator (particularly in nonsupervisory positions) should spend time with units of his branch to acquire the necessary training to keep current on new tactics and techniques. Where appropriate units are not readily available, training subjects of this nature should be included in the unit training schedule.

b. Extensive training is necessary to maintain aviator proficiency in both tactical and nontactical flying. This training must provide instruction in the latest flight regulations and ground subjects, and must include cross-training in all functions of the unit to which he is assigned.

154. Warrant Officer

Aviation training of officers applies also to warrant officers. Since warrant officers do not have a specific branch, they should be trained with, and observe the tactics and techniques of, the ground unit in which they will function.

155. Enlisted

a. *General.* ATP 21-114 delineates the required basic combat training for enlisted men. The objective of basic combat training is to produce a physically conditioned soldier, indoctrinated and drilled in the fundamentals of soldiering. After completing this training, the soldier must receive advanced individual training and/or school and on-the-job training to qualify him in an MOS. For instance, a crew chief is required to be MOS-qualified to perform his assigned duties. He must receive on-the-job training to develop his MOS proficiency, but he also must maintain his basic soldiering ability. Priorities must be established to prevent unnecessary or inadequate training and workloads.

b. *Advanced Individual Training.*

- (1) The training of enlisted specialists—particularly in communications, vehicle and aircraft maintenance, avionics, and air traffic regulation and identification—is one of the aviation

commander's most important training responsibilities. This training which is the foundation for the subsequent advanced individual phase, must be carefully planned and closely supervised. The three means of accomplishing this MOS training are service schools, unit schools, and on-the-job training.

- (2) To obtain maximum results in limited time, specialists requiring school

training must be trained at established schools. Individuals unable to attend service schools will be unit trained in allied specialties until attendance at the appropriate service school is possible. School trained personnel should be employed to establish a unit school or to supervise on-the-job training of other personnel of like MOS. Maximum use should be made of Army subject schedules in this type of training.

Section III. UNIT TRAINING

156. Aviation Unit Training

a. General. Unit training consists of the basic unit phase and the advanced unit phase. The unit training phase consists of training in all phases of combat operations. During this phase, the unit spends much time in the field operating under simulated combat conditions. Increased emphasis is placed on leadership, administrative efficiency, unit integrity, teamwork, morale, and supply economy. Competitive exercises between subordinate elements can be advantageous in promoting proficiency in performance of tasks and pride of individuals in their unit.

b. Objective. The objective of unit training is to produce a unit capable of functioning as stated in section I of the unit's TOE.

- (1) *Basic unit training phase.* The objective of the basic unit training phase is to develop effective and coordinated sections and teams of individuals who have learned particular skills and techniques during the advanced individual training phase. These skills and techniques will be progressively developed to meet subordinate element requirements and ultimately produce an efficiently functioning unit. The basic unit training phase is further subdivided into a general training phase and a section training phase, which are integrated where appropriate. All enlisted personnel receive the general training; the various sections of the unit receive section training related to their particular specialty.

- (2) *Advanced unit training phase.* The advanced unit training phase is designed to implement training previously received and to mold the subordinate elements of the unit into a smoothly functioning unit. Maximum possible unit training time should be spent in bivouacs conducted under a simulated tactical situation. Particular attention will be given to—

- (a) Dispersion.
- (b) Concealment.
- (c) Local security (including means of combating insurgents and infiltrators).
- (d) CBR protective measures.
- (e) Individual and unit protective measures against nuclear weapons effects.

c. Operations in Bivouac. Bivouac operations during the unit training phase will afford the best opportunity for aviators to apply the individual proficiency developed in their advanced individual training to the actual performance of aviation support missions. Individual aviators and sections are combined to operate as a smoothly functioning unit under simulated tactical conditions. During this phase, the capabilities and limitations of the unit are clearly determined. Any additional training necessary to prepare the unit for field exercises and maneuvers is also determined.

157. Aviation and Supported Unit Training

Every effort must be made to combine the training of the various support elements of the

aviation unit with those of the supported unit. This combined training phase promotes maximum coordination and understanding between supporting and supported units during combat, and is necessarily integrated with the unit training phase of both the aviation unit and the supported unit.

158. Field Exercises and Maneuvers

a. Field exercises and maneuvers are the means of applying tactics and techniques to specific situations under simulated combat conditions. They are intended to integrate components into an effective and coordinated unit and to insure the successful performance of operational missions. Their success depends upon thoroughness of preparation, intelligence of direction, and the amount of realism afforded. The use of aggressor troops contributes to realism in training. The initiative of subordinates is tested by unexpected attacks—air and ground, simulated or real—and the assessment of casualties. Field exercises and maneuvers reflect all functions performed by the unit and require maximum teamwork. They will include, but not be limited to—

- (1) Performance of all normal mission capabilities.
- (2) Signal communications, including

transmission security and alternate means of communication.

- (3) Liaison.
- (4) Intelligence that stresses the accurate, prompt, and complete reporting of information.
- (5) Escape and evasion.
- (6) Individual and unit protective and defensive measures (active and passive), to include use of demolitions and camouflage and concealment.
- (7) Unit action against air, airborne, and ground attack; and means of combating guerrillas and infiltrators.
- (8) Route reconnaissance.
- (9) March discipline and convoy organization and regulation.
- (10) Organizational maintenance.
- (11) Bivouac procedures, including field messing and sanitation.
- (12) First aid for casualties and mass evacuation.
- (13) Supply procedures; and leadership, cadre, and key specialist training.

b. During the conduct of an exercise, good points and bad points should be observed. A critique should be held following each exercise, with emphasis on methods of correcting deficiencies.

CHAPTER 18

SAFETY

159. Safety Program

The purpose of an aircraft accident prevention program is to accelerate accomplishment of Army aviation missions through improved operation of aircraft. An effective program must not restrict missions by inhibiting flying personnel, by unwarranted grounding or restricting of aircraft, or by impractical recommendations requiring action beyond the limits of available resources. An effective accident prevention program will reduce to a minimum the number of lives lost, injuries sustained, and aircraft damaged or destroyed in noncombat accidents. (This philosophy is not applied to justify the assumption of unnecessary risks.) The cost of modern aircraft and the expense of training personnel makes maximum conservation of these resources a principal consideration in the planning and accomplishment of each operation.

160. Preaccident Plan

a. As warranted by an installation's aircraft population, a preaccident plan will be developed. The plan should provide for—

- (1) A crash-alarm system.
- (2) A crash-rescue plan (SR 95-50-1).
- (3) Prior appointment of an aircraft accident investigation board. This board should consist of the most capable investigation personnel available to the appointing authority.
- (4) The assignment of responsibilities for technical assistance to the investigator, to include—
 - (a) *Engineer*—for surveying and mapping the debris pattern and preparing sketches.
 - (b) *Signal Officer*—for photographic assistance and communications.
 - (c) *Public Information Officer*—for han-

dling press representation and public information releases.

- (d) *Aviation Medical Officer (Flight Surgeon)*—for treatment and examination of personnel, and medical investigation.
 - (e) *Chaplain*—for assistance to personnel.
 - (f) *Transportation Officer*—for assistance in handling and dismantling material and for providing transportation to and from the crash site.
 - (g) *Provost Marshal*—for providing guards, traffic control, and security of classified equipment.
 - (h) *Safety Officer*—for technical assistance relating to accident prevention and causation.
- (5) An aircraft investigation kit containing equipment needed immediately upon arrival at the accident scene (app. VII).
- (6) Authority for the investigator to request technical assistance from any agency available to the command.

b. A type preaccident plan is presented in appendix VIII.

161. Accident Investigation

a. All personnel concerned with investigation of an accident must fully understand their duties and carry proper identification at all times.

b. Complex accidents may require, in addition to the services of the normal technicians, professional services of experts such as aerodynamicists, metallurgists, power plant engineers, aviation psychologists, instructor pilots, airframe engineers, fuel analysts, or such other specialists as may be warranted by the cir-

cumstances. Factory technical representatives may be consulted, but their tendency to defend their product should be weighed in evaluating the testimony of these persons. In no case will an individual be allowed to withhold or remove accident material unless specifically authorized for technical analysis purposes.

c. When an accident occurs, priority of procedures will be determined by the circumstances of the accident. Procedures will usually follow this order:

- (1) Rescue of personnel.
- (2) Guarding the wreckage.
- (3) Organization of the investigation and determination and procurement of required specialists.
- (4) Assignment of duties and dispatch of assistants.
- (5) Investigation and analysis to determine cause factors.
- (6) Consideration of cause factors and evaluation of the findings.
- (7) Preparation of the accident report.

d. The Investigation Division of the United States Army Board for Aviation Accident Research (USABAAR) conducts investigations of Army aircraft accidents of unusual significance. Division teams are immediately available to provide investigation assistance to commanders of major commands; to the Chief, National Guard Bureau; and to commanders

of Class II installations. An accident of unusual significance is one in which—

- (1) The aerodynamical behavior of the aircraft is such that there is no known precedence.
- (2) The cause factors may confirm previously suspected but unconfirmed causes.
- (3) Unusual public interest may be aroused.
- (4) Information may be gained that will contribute to special studies in aviation safety.

e. The purpose of aircraft accident investigation is to prevent future accidents by assembling sufficient data and evidence to indicate causal conditions which, had they been previously corrected or changed, would have prevented the accident or minimized the extent of damage or degree of injury. This information is to be used for accident prevention purposes only.

f. Graduates of the U.S. Army Aviation Safety Course should be employed when available.

g. The following references will be useful in accident investigation procedures:

- (1) AR 15-76.
- (2) AR 385-40.
- (3) DA Pam 95-5.
- (4) SR 95-50-1.

PART FIVE
SERVICE AND SUPPORT
CHAPTER 19
AVIATION MEDICINE

162. General

Aviation medicine is that specialized practice of medicine which is concerned with the study, prevention, and alleviation of diseases and injuries arising from the aviation environment and operational flying.

a. Aviation medicine is occupational health applied to men who fly. It is oriented toward health rather than disease. It applies the principles of clinical and preventive medicine to the problems inherent in flying.

b. Aviation medicine support is essential to realization of the full capabilities of Army aviation. Aeromedical support is a matter of extreme interest to the aviator and his commander, as well as the flight surgeon. Efficiency, care, and "maintenance" are as important for the aviator as for his aircraft.

163. Medical Requirements for Flying

Medical standards for flying are based upon considerable experience and on appreciation of the physiological and psychological requirements of military aviation. They are intended to insure that the aviator is medically capable of performing his several and varied tasks. Medical standards are designed to insure that the aviator is not only safe in the air, but also that he may fly proficiently and for a reasonable period of time. Medical standards are equally as important for Army aircraft aviators as for pilots of higher performance aircraft. The less sophisticated the aircraft, the greater will be the requirement placed upon the aviator's physical, physiological, and psychological capabilities.

164. The Army Aviation Medical Officer

The Army aviation medical officer provides specialized aviation medical service to Army aviators and supporting ground personnel.

a. Army aviation medical officers receive specialized training in aviation medicine, and are capable of providing general medical care with moderate specialization in the fields of eye, ear, nose, throat, heart, lungs, neuropsychiatry, and preventive medicine. They also provide staff medical advice concerning medical problems related to aviation.

b. Army aviation medical officers are assigned to divisions, Transportation Corps aviation battalions, and to U.S. Army hospitals responsible for the care of 30 or more Army aviators. Their primary responsibility is to implement the Army aviation medicine program at unit level. Such other duties as may be assigned should not interfere with the performance of this primary mission.

165. Army Aviation Medicine

The Army aviation medicine program include the following five specific functions:

a. Medical examinations are provided for the initial selection of applicants for flight training and for guiding their utilization during subsequent operational flying. This continuing "quality control" provides a means of eliminating the unfit before they become a hazard.

b. Clinical care of aviation personnel is provided with special consideration of the specific problems inherent in flight. The effects of various diseases and medications upon flying safety and proficiency are carefully evaluated.

Emphasis is placed upon shortening the period of disability. Aviators are suspended from flying until they are again safe in the air.

c. The "care of the flyer" is directed toward the maintenance of flying safety and proficiency. It is a preventive medicine program which makes use of all available information and techniques. Special studies are conducted of such special problems of the flying environment as hypoxia, pressure changes, heat, cold, noise, vibration, acceleration, and fatigue. Physiological training of aviation personnel is an important part of health education.

d. Aviation medicine advice is provided to aviators, commanders, and boards of officers. The aviation medical officer's familiarity with military flying insures that such advice is timely and realistic. To insure full medical participation in the investigation and analysis of aircraft accidents, aviation medical officers are included members of aircraft accident investigation boards.

e. Aviation medicine is important in the development of improved policies, procedures, aircraft, and related equipment. Information gained during the performance of the functions outlined in *a* through *d* above is used in providing medical and human factors advice to responsible development agencies.

166. Responsibilities of Aviators

The aviator is ultimately responsible for the maintenance of his own health and physical fitness. He should insure that his diet is adequate, but not excessive. He must maintain peak physical fitness through proper exercise. He must avoid excesses which may impair his flying proficiency. He must avoid self-medica-

tion and report to the aviation medical officer when he has reason to believe that he is ill. He should wear such protective equipment as is made available to him.

167. Responsibilities of Commanders

The commander is responsible for the proficiency of his unit and the health and welfare of his personnel. To carry out this responsibility, he should utilize fully the services of his aviation medical officer. He should insure that aeromedical services are reasonably available and properly used. Time must be allowed for participation in physical exercise. All flying activities must be supervised to insure that aviators are not assigned missions beyond their capabilities, nor permitted to fly to the point of fatigue and decreased performance. Aggressive action should be taken to eliminate any aviator who is unfit to continue to fly safely and proficiently.

168. Medical Aspects of Flying

Military aviation is associated with certain unavoidable environmental hazards such as hypoxia, pressure changes, heat and cold, noise and vibration, and acceleration. The adverse effects of these factors may be minimized by an understanding of their nature, and by adopting the prescribed protective measures concerning them. Details on these environmental factors are contained in TB MED 224. They should be thoroughly understood by each aviator, especially since aviators are away from the detailed supervision of aviation medical officers for considerable periods of time. Medical aspects of flying should be discussed at flying safety meetings and during annual physical examinations for flying.

CHAPTER 20

AVIATION SUPPLY

169. Aviation Technical Supply

The purpose of aviation technical supply (i.e., supply, exclusive of TOE items peculiar to aviation) is to issue repair parts and replacement items necessary to maintain Army aircraft. The technical supply section of the field maintenance facility supplies or processes all air items required to support aviation units. Air items are requisitioned from the responsible technical service through the appropriate technical service representative; e.g., radio equipment is requisitioned from Signal Corps supply depots through the appropriate signal officer.

170. Classification of Aviation Supply

All Army air items are classified as principal or as secondary items.

a. Principal Air Items. Army aircraft, trainers, and flight simulators are classified as principal air items. Authorization tables (Tables of Organization and Equipment, Tables of Allowances), Equipment Modification Lists, circulars, approved projects, and letters of special authority are the requisitioning authority for these items.

b. Secondary Air Items. All air items (including end principal air item components and repair parts) that have not been classified as principal air items are classified as secondary air items.

171. Supply Channels

Technical supply items are requisitioned by organizations in the same manner as unit supply items.

a. Zone of Interior. AR's of the 715-, 725-, 750-, and 755-series contain information on the requisitioning of items from the Zone of Interior.

b. Oversea Supply Support.

- (1) The oversea commands establish depot stock levels. Oversea depots are responsible for requisitioning from designated Zone of Interior depots as necessary to maintain stock levels and provide supply support to stations, units, and activities in filling requisitions (fig. 23).
- (2) Oversea supply support is illustrated in figure 24. The fourth echelon maintenance activity establishes the station stockage objective for an item, requisitions and procures it from the depot in accordance with AR 715-30, receives and stores it, and issues it to the third echelon maintenance activity for use or reissue to Army aviation activities performing organizational maintenance. Repairable items are repaired at all levels within their repair capability and returned to serviceable stock. Repairable items beyond the capability of fourth echelon repair are sent to depot for maintenance and return to serviceable stock.

172. Supply Procedures—General

The primary function of the aviation technical supply section is to receive, record, store, and issue replacement parts for the maintenance of Transportation air items.

a. Source of Supply. AR 725-750 designates the source of supply for Transportation Corps supplies and equipment including Transportation air items. (Other technical service air item supplies are governed by regulations.)

b. Replenishment of Stocks. Organizational stocks are replenished to maintain stock levels prescribed by appropriate depots of stock control points. Requisitions will contain only

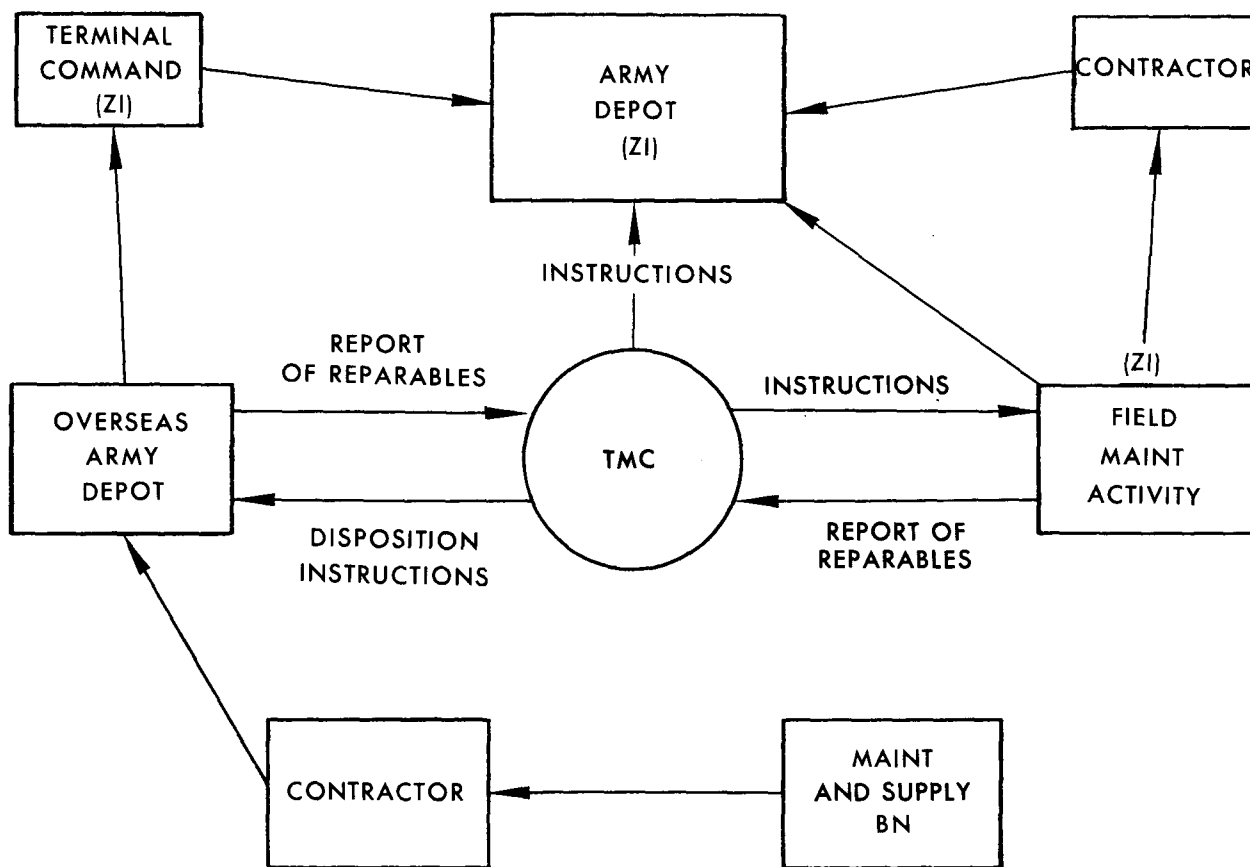


Figure 23. Flow of reparable.

those items on authorized stocklists. They will cover the quantities required to bring the total quantities on hand, and on order, to meet the requisitioning objective.

173. Army Field Stock Control System (AFSCS)

The Army Field Stock Control System (AFSCS) facilitates the economical distribution of secondary air items with particular emphasis on repair parts. Its objective is to insure that an adequate amount of supplies is in the proper place at the proper time without over-stocking at any point of supply. Further details are outlined in AR 711-16 and FM 1-10.

174. Supply Economy

a. General. Supply economy is the practice of conservation of materials by every individual in the Armed Forces; it is developed through training and practice until it becomes a habit.

b. Stock Levels. DA technical manuals of the 55-series for each type aircraft constitute authority for stockage of repair parts. At each supply echelon, commanders should insure that stock control activities are efficiently operated; that requisitioning objectives are correctly computed and continuously reviewed; and that, when necessary, these objectives are revised to keep them realistic.

c. Reclamation and Salvage. All serviceable air items eventually become unserviceable as a result of damage, failure, or normal wear. Items are restored to serviceability by the lowest maintenance level capable of performing the work economically without interfering with the accomplishment of its primary mission. Further details are contained in AR 750-713 and AR 755-7.

d. Cannibalization. Cannibalization policies established in AR 750-1500-8 will be closely followed.

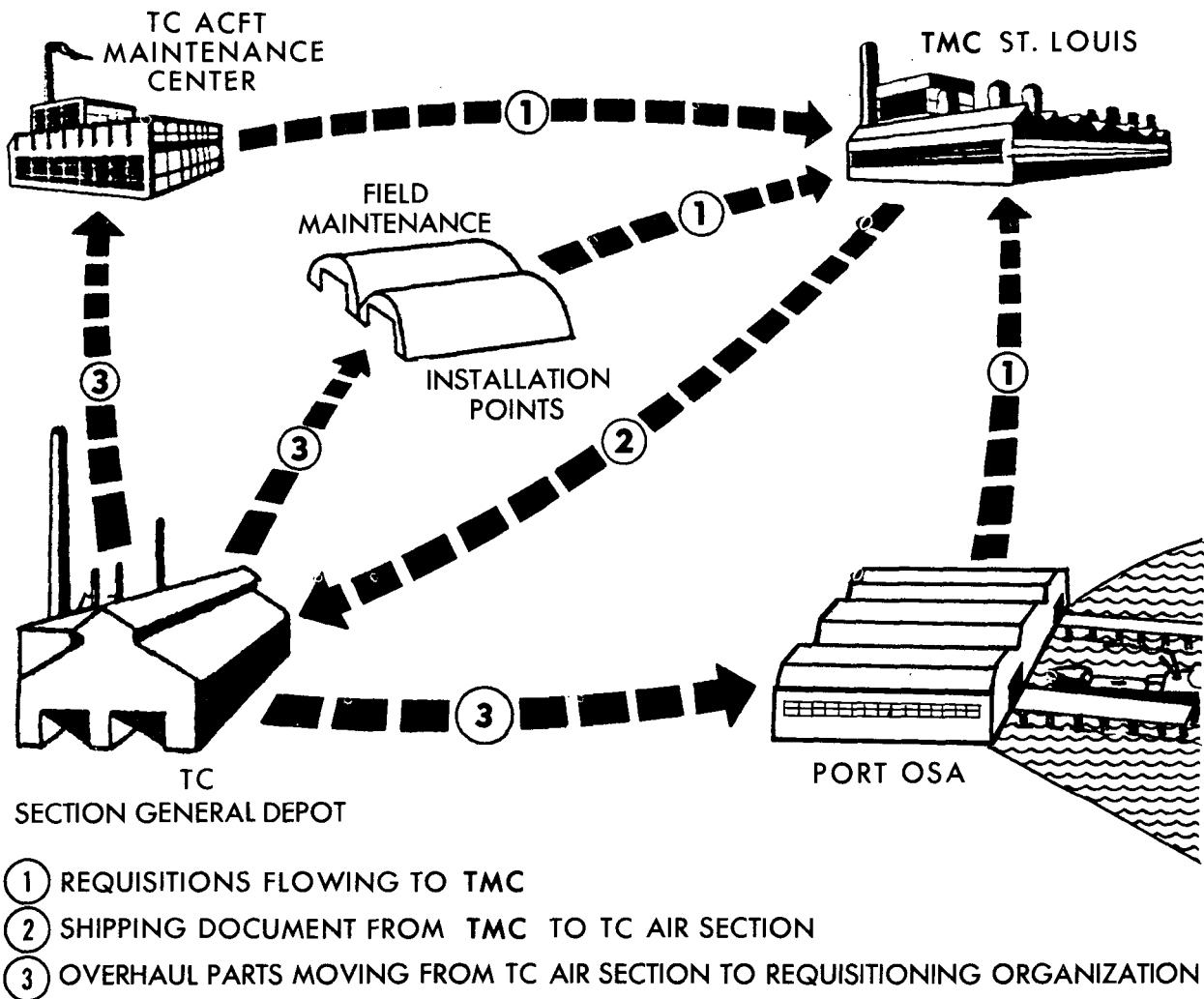


Figure 24. Flow of Requisitions and supplies.

CHAPTER 21

AVIATION MAINTENANCE

175. Maintenance Categories

As outlined in AR 750-5, maintenance operations are classified by categories according to their frequency and magnitude, and the degree of technical skill required. The categories of maintenance are *organizational*, *field*, and *depot maintenance*. These are discussed in relation to Army aviation in FM 1-10. Jobs are allocated to using organizations and technical service organizations in accordance with the principles outlined in AR 750-6.

a. The allocation of functions to the five echelons of maintenance is covered in general in AR 750-6 and, specifically for each major item, in the appropriate maintenance allocation chart.

b. Major commanders will give full consideration to having their respective organizational and field maintenance performed by commercial contract or cross-servicing agreements. Such arrangements may be necessary when maintenance requirements exceed the capacity of available Government-owned or Government-operated facilities, or when the cost of obtaining additional facilities is uneconomical.

176. Principles

a. Maintenance of Army aircraft and allied equipment is performed in the manner and at the maintenance level that will best accomplish the earliest return of material to the using organization. Applicable maintenance principles are discussed in FM 1-10.

b. Reports will be submitted to the appropriate commander concerning any abuse of equipment that results when a unit performs maintenance at a higher echelon than that authorized in its mission.

177. Responsibility

Commanders and staffs will insure that all equipment issued or assigned to their com-

mands is maintained in a serviceable condition. This includes the responsibility for—

a. *Preventive Maintenance*. See TM 1-320.

b. *Command Supervision*. See AR 750-5.

c. *Safety of Flight*. Commanders and staffs must attach proper importance to safety of flight conditions. Safety of Flight Supplements containing important operational, preventive, and restrictive instructions are issued to give prompt safety of flight information. Applicable TM's of the 55-series contain detailed information on individual aircraft.

178. Maintenance Planning

Commanders and staffs will insure that all members of their commands realize the importance of aviation maintenance planning. This is necessary to insure successful completion of the overall mission of the command. The aviation maintenance officer must have sufficient advance knowledge of the command's mission requirements to be able to plan adequate aviation maintenance support. Further details are outlined in FM 1-10.

179. Aircraft Maintenance Inspections

a. *Purpose*. Aircraft maintenance inspections—

- (1) Insure that preventive maintenance services are effective in detecting and correcting potential failures of materiel.
- (2) Determine the serviceability, completeness, and field readiness of materiel in the hands of using units. Inspections are continued during combat to determine the need for materiel rehabilitation and replacement. Inspections conducted before operations insure that equipment is ready for combat; after operations, inspections

determine action required to restore the combat effectiveness of equipment.

- (3) Develop teamwork between the using organization and supporting maintenance units.
- (4) Assist in matters affecting supply.
- (5) Provide instruction in administration and operation of organizational supply and maintenance.
- (6) Detect and analyze the most prevalent deficiencies in maintenance of materiel. A detailed unsatisfactory report is submitted in order to direct the attention of the commanding officer, maintenance personnel, and design engineers toward specific improvement.
- (7) Anticipate unusual supply demands.
- (8) Evaluate relative efficiency of organizational maintenance in units of the command.
- (9) Determine deficiencies in training which permit appropriate recom-

mendations to be emphasized in the training of using units.

- (10) Enhance periodical recording of the condition of materiel in the hands of troops. By this means, responsibility for unwarranted deterioration and abuse can be determined.

b. Types of Inspections. All inspections of equipment are conducted under command authority. They are the means by which commanders at all echelons, acting within the scope of their command missions, determine the serviceability of equipment and the efficiency of maintenance. (See AR 750-8 and TM's appropriate to the aircraft concerned.)

180. Aircraft Maintenance Records

Aircraft maintenance records are outlined in TM 38-750. This technical manual establishes a record system applicable to all Army equipment and provides detailed instructions for the preparation, use, and disposition of aircraft maintenance records integral to the system.

APPENDIX I

REFERENCES

AR 15-76	United States Army Board for Aviation Accident Research.
AR 40-353	Evacuation of Patients.
AR 40-501	Standards of Medical Fitness.
AR 40-535	Aeromedical Evacuation.
AR 40-574	Insect Control by Aircraft.
AR 66-5	Courier Service—General Provisions.
AR 66-10	Instructions for Designated Couriers.
AR 95-10	Use of Army Aviation in Disaster Operations and Search and Rescue Operations.
SR 95-50-1	Procedures for Aircraft Crash Firefighting and Rescue.
AR 95-51	Aerial Observer Training.
AR 95-75	Delineation of Service Responsibilities for Air Control Teams.
AR 95-100	Clarification of Roles and Missions of the Department of the Army and Air Force Regarding Use of Aircraft.
AR 95-415	Concept of Employment of the Helicopter in the Amphibious Assault.
AR 130-400	Logistical Policies for Support.
AR 320-5	Dictionary of U.S. Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 385-40	Accident Reporting and Records (Reports Control Symbol CSGPA-147 (R2), 459, 584, 646, and CSGPO-214).
AR 500-60	Disaster Relief.
AR 600-20	Army Command Policy and Procedures.
AR 700-40	Army and Air Force Responsibilities for Certain Personal Property.
AR 700-2300-40	Army Medical Service Ambulances.
AR 700-2800-2	Installed and Spare Aircraft Engines (Reports Control Symbol TC-174).
AR 700-26	Designating, Redesignating, and Naming Military Aircraft.
AR 710-1500-8	Army Aircraft Inventory, Status, and Flying Time.
AR 711-16	Installation Stock Control and Supply Procedures (Army Field Stock Control System).
AR 715-series	(Procurement.)
AR 725-series	(Issue of Supplies and Equipment.)
AR 735-5	Property Accountability: General Principles and Policies.
AR 735-11	Accounting for Lost, Damaged, and Destroyed Property.
AR 750-series	(Maintenance of Supplies and Equipment.)
AR 755-series	(Disposal of Supplies and Equipment.)
FM 1-5	Army Aviation: Organizations and Employment.
FM 1-10	Army Aviation Organizational Aircraft Maintenance and Supply.
FM 1-15	Aviation Battalion—Infantry, Airborne, Mechanized, and Armored Divisions.
FM 1-60	Army Aviation Air Traffic Operations—Tactical.
FM 1-80	Aerial Observer Training.
FM 3-12	Operational Aspects of Radiological Defense.
FM 5-20	Camouflage, Basic Principles and Field Camouflage.

FM 5-34	Engineer Field Data.
FM 5-25	Explosives and Demolitions.
FM 6-121	Field Artillery Target Acquisition.
FM 6-2	Field Artillery Survey.
FM 6-20-1	Field Artillery Tactics.
FM 6-20-2	Field Artillery Techniques.
FM 6-40	Field Artillery Cannon Gunnery.
FM 6-120	The Field Artillery Observation Battalion and Batteries.
FM 6-135	Adjustment of Artillery Fire by the Combat Soldier.
FM 7-30	Infantry, Airborne and Mechanized Division Brigades.
FM 7-100	Infantry Division.
FM 8-5	Medical Service Units, Theater of Operations.
FM 8-10	Medical Service, Theater of Operations.
FM 8-15	Division Medical Service, Infantry, Airborne, Mechanized, and Armored Divisions.
FM 8-35	Transportation of the Sick and Wounded.
FM 8-55	Army Medical Service Planning Guide.
FM 10-40	Quartermaster Aerial Supply Company.
FM 11-series	(Signal.)
FM 17-1	Armor Operations; Small Units.
FM 17-30	The Armored Division Brigade.
FM 17-36	Armored Cavalry Platoon and Troop, Air Cavalry Troop and Divisional Armored Cavalry Squadron.
FM 17-100	The Armored Division and Combat Command.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-11	First Aid for Soldiers.
FM 21-20	Physical Training.
FM 21-26	Map Reading.
FM 21-30	Military Symbols.
FM 21-31	Topographic Symbols.
FM 21-40	Small Unit Procedures in Nuclear, Biological, and Chemical Warfare.
FM 21-41	Soldier's Handbook for Nuclear, Biological, and Chemical Warfare.
FM 21-60	Visual Signals.
FM 21-75	Combat Training of the Individual Soldier and Patrolling.
FM 21-76	Survival.
FM 21-77	Evasion and Escape.
(C) FM 21-77A	Evasion and Escape (U).
FM 24-18	Field Radio Techniques.
FM 24-20	Field Wire and Field Cable Techniques.
FM 27-10	The Law of Land Warfare.
FM 30-series	(Military Intelligence.)
FM 31-series	(Special Operations.)
FM 33-5	Psychological Operations.
FM 41-5	Joint Manual of Civil Affairs/Military Government.
FM 41-10	Civil Affairs Operations.
FM 44-1	Air Defense Artillery Employment.
FM 55-6	Transportation Services in Theaters of Operation.
FM 57-10	Army Forces in Joint Airborne Operations.
FM 57-35	Airmobile Operations.
FM 57-38	Pathfinder Operations.

FM 61-100	The Division.
FM 100-series	(Field Service Regulations.)
FM 101-series	(Staff Officers.)
FM 101-5	Maneuver Control.
SM 5-4-4210-514	Fire Fighting Equipment Set.
TB MED 244	Medical, Army Aviation Medicine.
TM 1-235	Float, Ski, and Tandem Landing Gear Operations.
TM 1-300	Meteorology for Army Aviation.
TM 1-320	Organizational Aircraft Maintenance Supervisor's Manual.
TM 3-series	(Chemical.)
TM 5-series	(Engineers.)
TM 9-1900	Ammunition, General.
TM 9-1950	Rockets.
TM 10-500-series	Air Delivery of Supplies and Equipment.
TM 10-500-6	Air Delivery of Supplies and Equipment; L-19E (Bird Dog) Army Aircraft.
TM 10-1101	Petroleum-Handling Operations.
TM 11-series	(Signal.)
TM 11-257	Jeppesen Airway Manual (Vols. 1, 2, 3).
(C) TM 23-200	Capabilities of Atomic Weapons (U).
TM 30-246	Tactical Interpretation of Air Photos.
TM 38-250	Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft.
TM 38-750	The Army Equipment Record System and Procedures.
TM 55-series	(Transportation.)
TM 57-210	Air Movement of Troops and Equipment.
TM 57-220	Technical Training of Parachutists.
(C) ACP-124*	Communications Instruction, Visual Signaling Procedures (U).
ACP-136*	Communications Instruction, Panel Signaling.
ACP-168A*	Communications Instruction, Pyrotechnic Signals.
ATP 21-114	Male Military Personnel Without Prior Service.
DA PAM 95-5	Handbook for Aircraft Accident Investigators.
DA PAM 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono Recordings.
DA PAM 310-series	Military Publication Indexes.

* These Allied Communications publications are indexed in (C) JANAP 201 status of new cryptographs JANAP's and ACP's.

APPENDIX II

DESIGNATION OF ARMY AIRCRAFT

<i>Name</i>	<i>Former Designation</i>	<i>Current Designation</i>
Observation Series		
Bird Dog	L-19A	O-1A
Bird Dog	TL-19D	TO-1D
Bird Dog	L-19E	O-1E
Utility Series		
Otter	U-1A	U-1A (Same)
Beaver	L-20A	U-6A
Seminole	L-23D	U-8D
Seminole	RL-23D	RU-8D
Seminole	L-23E	U-8E
Seminole	L-23F	U-8F
Aero Commander	L-26B	U-9B
Aero Commander	L-26C	U-9C
Aero Commander	RL-26D	RU-9D
VTOL & STOL Series		
Mohawk	AO-1A	OV-1A
Mohawk	AO-1B	OV-1B
Mohawk	AO-1C	OV-1C
Caribou	AC-1	CV-2A
Caribou	AC-1A	CV-2B
Helicopter Series		
Iroquois	HU-1	UH-1
Iroquois	HU-1A	UH-1A
Iroquois	HU-1B	UH-1B
Iroquois	HU-1D	UH-1D
Sioux	H-13E	OH-13E
Sioux	H-13G	OH-13G
Sioux	H-13H	OH-13H
Sioux	H-13K	OH-13K
Chickasaw	H-19C	UH-19C
Chickasaw	H-19D	UH-19D
Shawnee	H-21B	CH-21B
Shawnee	H-21C	CH-21C
Raven	H-23B	OH-23B
Raven	H-23C	OH-23C
Raven	H-23D	OH-23D
Raven	H-23F	OH-23F
Choctaw	H-34A	CH-34A
Choctaw	H-34C	CH 34C
Mojave	H-37A	CH-37A
Mojave	H-37B	CH-37B
Chinook	HC-1B	CH-47A

APPENDIX III

EXAMPLE OF ARMY AVIATION SUPPORT PLAN ANNEX TO THE DIVISION OPERATIONS ORDER

The Army aviation support plan is prepared in conjunction with, and published as, an annex to the division operations order. Close liaison between the aviation support representative at both corps and division tactical operations centers (TOC) is maintained to acquaint corps with division requirements and to inform division of corps decisions. Similarly, those units requiring aviation or additional support at subordinate echelons maintain contact with representatives in the division TOC. The division plan of operations and the Army aviation support plan are evolved at the same time so that the Army aviation support plan annex can accompany the division operation order when issued.

The aviation support plan is designed to make known those procedures which are different from those established in the SOP and instructions for other supporting aviation.

An example aviation support plan annex issued by the 21st Infantry Division is shown below.

(Classification)

Copy No. 2

21st Inf Div

FAMBACH (978225), GERMANY

190015 June 19__

WB9

Annex D (Army Aviation Support Plan) to OPORD 15

Reference: Maps GERMANY, 1:50,000, EISENACH,
WALTERSHAUSEN, GOTHA, ERFURT,
KALTENNORDHEIM, MEININGEN,
SCHLEUSINGEN, STADTILM.

1. SITUATION

a. Enemy, OPORD 15.

b. Friendly, OPORD 15.

c. Attachments and Detachments, 405th Trans Bn (Transport Aircraft) operational control effective 192000 June 19__.

2. MISSION

Army aviation supports the seizure of Obj, 19 and 20 by airmobile assault, beginning 190330 June; provide normal reconnaissance, observation and liaison flights.

CLASSIFICATION

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3. EXECUTION

a. Concept of Operation. OPORD 15.

b. 21st Avn Bn. This battalion provides general support for division with following changes from SOP.

- (1) Priority of surveillance missions to 3rd Brigade through D+2.
- (2) Provide 5-ton lift capability to G4 daily through D+2.
- (3) Provide Div Surgeon 6-patient lift capability through D+1.

c. 405th Trans Bn (Transport Acft).

- (1) Provide lift for 3rd Brigade to Obj 19. Annex E (Air Movement Plan) to OPORD 15.
- (2) Establish and operate MCC in 3rd Brigade loading area.
- (3) Upon completion of lifting 3rd Brigade to Obj 19, return to loading area and prepare to lift 3rd Brigade from Obj 19 to Obj 20 on order.

d. Coordinating Instructions.

- (1) Aircraft operating in div area below 300 feet, monitor 405th Trans Bn (Transport Acft) MCC frequency.
- (2) Flights originating within division area, to be reported 21st Avn Bn opns sec as soon as possible after the aircraft becomes airborne.
- (3) See Annex E (Air Movement Plan) to OPORD 15 for safe flight routes.

4. ADMINISTRATION AND LOGISTICS

a. ADMINO 17.

b. 405th Trans Bn (Transport Acft) report class III requirements and recommend delivery schedule to division ADSOC.

5. COMMAND AND SIGNAL

a. SOI Index 1-7.

b. Appendix I, Army Aviation Command and Control Plan.

Acknowledge

Kark
Maj Gen

Appendix: I—Army Aviation Command and Control Plan. (omitted).

Distribution: B

2-405th Trans Bn (Transport Acft)

Official:

/s/ Ward

/t/ Ward

G3

CLASSIFICATION

APPENDIX IV

EXAMPLE OF ARMY AVIATION ANNEX TO A DIVISION STANDING OPERATING PROCEDURE (SOP)

The SOP is published in the format that is most effective for the command, but, regardless of format the SOP is published by authority of the commander. It is a combat order in its own right and carries the same weight as other orders or instructions. Although an SOP is usually based on several field manuals, it does not repeat material specifically treated in any manual. This example is for illustrative purposes only.

CLASSIFICATION

Copy No. _____
21st Infantry Division
Fort Rucker, Alabama
1 Dec 19__

Annex E (Army Aviation) to SOP

1. GENERAL

a. Applicability. This annex applies to aviation with 21st Inf Div except when modified by div order or change to Div SOP.

b. Purpose. This SOP standardizes normal procedures for operations and control of all Army aviation assigned, attached, or under operational control of the 21st Inf Div.

c. Unit Procedures. Subordinate unit issues SOP to conform.

2. ORGANIZATION FOR COMBAT

a. 21st Aviation Battalion General Support Division.

(1) Tactical grouping.

(a) 1st echelon. Hq & Hq co, aviation co (GS), aircraft maintenance co, located at div instrumented airfield.

(b) 2nd echelon. Airmobile co dispersed at forward airfield.

(2) Bn Hq provides representative for AAE, TOC.

b. Other Organic Aviation. Other organic aviation remains under operational control of parent unit.

c. Nonorganic Aviation. Aviation support attached to or placed in support of the 21st Infantry Division from other units will be placed under operational control of the division aviation officer or under operational control of a specific supported unit on a mission basis.

3. INTELLIGENCE

a. General Data. (See Annex A (Intelligence))

b. Reconnaissance and Surveillance.

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- (1) Planned observation and photo air recon within capabilities of organic aircraft assigned by units and coordinated with AAE, TOC.
- (2) Capabilities of organic Army aviation will be fully exploited prior to requests for interservice support.
- (3) Requests for airlift in support of extended ground recon submitted to AAE.
- (4) Observation.
 - (a) Area coverage of all organic aviation elements will be coordinated by AAE, TOC.
 - (b) Extent of area coverage reported to AAE.

c. Enemy Material. Aircraft maintenance co, maintenance bn, and aviation bn provide technical assistance to the division G2.

d. Aviation Charts. Requisition for aviation charts and photographs are directed to the supply and transportation bn.

e. Counterintelligence.

- (1) Camouflage of aircraft, airfields, supplies, equipment, and facilities is the responsibility of all aviation unit commanders. A maximum camouflage effort will be exerted.
- (2) Documents containing classified information, except required portions of daily SOI, will not be carried beyond the FEBA.

f. Escape and Evasion.

- (1) Aviators will be briefed on pickup points, times, identification signals, and points to infiltrate lines on every mission beyond the FEBA. Pickup points will be designated in Aviation Annex to div OPORD.
- (2) If the enemy situation permits, make a suitable landing site in the vicinity of downed aircraft for evacuation. If not, destroy the aircraft.
- (3) Personnel found down behind enemy lines and not immediately rescued will move to pickup points designated in briefing. Pickup points will not be occupied except for periods of 30 minutes prior to and following sunrise, sunset, or other predesignated time.
- (4) If the enemy situation precludes occupying pickup points, avoid capture and attempt to join units by infiltration. If the situation demands that casualties be abandoned, provide them with available supplies and conceal them.
- (5) All counterintelligence activities of aviation units within the division will be coordinated by the division aviation section.

4. OPERATIONS

a. Security.

- (1) Local security of aviation facilities is the responsibility of the senior aviation commander utilizing that facility. Area defense is the responsibility of supported unit.
- (2) The aviation unit commander should coordinate with the supported unit commander concerning additional troop support for security of aviation facilities, if required.

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b. Air Traffic Regulation and Identification (AATRI).

- (1) The Army aviation section exercises staff supervision over all air traffic regulation and identification facilities utilized by the division.
- (2) The division aviation section will coordinate AATRI activities of all aviation within the division.
- (3) The division aviation battalion will monitor and coordinate all flights within the division area of responsibility.
- (4) The 1st Brigade must be prepared to assume, on order, duty of monitoring and coordinating flights.
- (5) Coordination of flights must be made within the tactical operations center with AD and G2/G3 air.
- (6) Information on flights will be sent to the appropriate flight operations center.
- (7) Changes in air traffic regulations and identification procedures will be effected by NOTAMS.

c. Aircraft Utilization Planning.

- (1) Aircraft availability. The number of Army aircraft required for support of normal and special missions is to be determined for each mission on an individual basis. The types and number of aircraft available, operational control, logistical support to include maintenance, and the effects of existing weather are the determining factors.
- (2) Planning factors. Factors for planning the employment of Army aircraft are as follows:
 - (a) Aviator factor—4 hrs per day (short duration 6 hrs).
 - (b) Lift capability is figured on an individual mission basis. The aviation officer will keep current lift capability chart.
 - (c) For Army aircraft time distance factors, see appendix 1.
 - (d) For Army airfields, heliports, and navigational facilities, see appendix 2.
- (3) Exhaust available means prior to requesting division Army aviation support.

d. Search and Rescue Operations. See appendix 3.

e. Assignment of Missions.

- (1) Aircraft support to division headquarters is on the following priority:
 - (a) Commanding General.
 - (b) Assistant Division Commander.
 - (c) G3.
 - (d) Chief of Staff.
 - (e) G2.
 - (f) G4.
 - (g) Other staff officers.

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(2) Missions requiring the aerial movement of troops, supplies, and equipment by Army Aircraft will be allocated by the Division G3 and assigned to aviation units of the Army aviation section utilizing the following procedures.

- (a) Tasks will be assigned whenever possible on a mission basis; however, certain missions will require placing the aviation unit in direct support or attaching it to the supported unit.
- (b) To allow for maximum planning time, warning orders will be issued in the most expeditious means available by the division aviation officer directly to the operations officer of the unit receiving the mission.
- (c) A confirming order will be forwarded through command channel.
- (d) To facilitate coordination, direct communications will be authorized between the operations officer of the unit performing the mission and the unit being supported.

(3) CBR.

- (a) Aircraft will be diverted, if necessary, in event of nuclear burst to assess damage and confirm type of burst.
- (b) Radiological survey will receive first priority on use of aircraft. Chemical officer will determine area and obtain observer to accomplish mission to include briefing and debriefing on mission.
- (c) First priority in airlift is for transport of control and assessment teams with portion to remain with teams as required.
- (d) Remaining airlift will provide for emergency air movement of patients or augmentation of aeromedical evacuation.
- (e) Chemical dissemination by Army aviation will be on division order. Personnel to load, unload, and decontaminate aircraft as well as mission coordination will be furnished by division chemical officer.

(4) Organic or attached aviation will be employed as illumination delivery means on div order with coordination with TOC.

f. Requests for Additional Aviation Support.

- (1) Immediate through supporting or attached element to AAE, TOC.
- (2) Other through command channels.

g. Requests for Support of Aviation Mission.

- (1) Requests for offensive air as cover for aviation elements are submitted through command channel.
- (2) Requests for artillery support or lifting of friendly fires to aid or permit Army aviation employment should be submitted to the TOC.
- (3) Requests for engineer support in constructing airfields and heliports are coordinated with the AAE.

h. Medical Evacuation.

- (1) Normal requests for aeromedical evacuation or air movement of patients will be through medical channels.

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- (2) See inclosure 2 (Air Evacuation Procedure) to medical field SOP, 21st Inf Div.

i. Communications.

- (1) SOI and SSI in effect.
- (2) Liaison.
 - (a) Upon receipt of notification for a tactical support mission, the unit commander of the aviation unit supporting the operation will establish and maintain liaison with the supported unit.
 - (b) Aviation units which are directly attached to, or in support of, the division will establish liaison with the division Army aviation section.
 - (c) The aviation unit commander or his representative acts as a technical advisor to the supported unit on all matters pertaining to his unit organization and employment.

j. Movement.

- (1) Supporting elements displace with supported unit. Prior notification of new airfield or heliport to AAE.
- (2) Div AAE displace with div TOC.
- (3) Aviation bn (—) displace when beyond supporting distance.

k. Air Defense. Aircraft attacked by enemy air or ground fire take evasive action and immediately report location, type, and quantity of enemy action of div FSE.

5. LOGISTICS

a. Supply.

- (1) Class I (CI I).
 - (a) Sections supporting units by supported unit.
 - (b) Division AAE by div hq co.
 - (c) Remainder as prescribed.
 - (d) Two individual rations per place in each aircraft.
- (2) Class II and IV.
 - (a) Sections supporting units receive aviation items from the aviation bn. All other items from supported unit.
 - (b) Remainder of battalion by requisition to appropriate technical service.
- (3) Class III.
 - (a) All elements maintain 8 hr supply.
 - (b) Resupply of aviation POL through supply and transportation bn QM.
- (4) Salvage. Aviation items salvaged through aircraft maintenance company.

b. Logistical Employment.

- (1) Emergency aerial supply. By requisition to division ADSOC.
- (2) Aerial transport of personnel. By request to AAE, TOC.

CLASSIFICATION

CLASSIFICATION

6. REPORTS

a. Daily status report for all aircraft submitted to G4 through AAE, TOC by 2100 hrs.

(1) Units for organic aircraft.

(2) Aviation bn for all other aircraft.

(3) AAE provide G4 with consolidated report by 2200 hrs.

b. Daily operations report to G3 through div AAE, TOC.

c. Location of all airstrips and heliports prior to occupation.

d. NOTAMS to AAE, TOC.

Distribution A

Official:

/s/ Baker

Baker

G3

(Classification)

2 Incl

App 1, Army Aircraft Time Distance Factors. (Omitted.)

App 2, Army Airfields, Heliports, and Navigational Facilities.

App 3, Search and Rescue Operations.

(Classification)

APPENDIX 1 (ARMY AIRCRAFT TIME DISTANCE FACTORS)
TO ANNEX E
(OMITTED)

APPENDIX 2 (ARMY AIRFIELDS, HELIPORTS, AND
NAVIGATIONAL FACILITIES)
TO ANNEX E.

1. RESPONSIBILITY

a. Selection and construction of airfields and heliports is the responsibility of the aviation unit commander who will coordinate with the supported unit commander and his staff to take maximum advantage of area security and available routes of communication.

b. Division army aviation section will coordinate airfield and heliport assignments, priority of use, administrative and supply procedures, and security of all aviation units directly attached to or in support of the 20th Aviation Battalion.

2. SELECTION

a. Unless otherwise directed by division, the positioning of non-aviation airfields will be the responsibility of the unit assigned.

b. In coordination with G3, the division aviation officer will designate the site for the division airfield. The division aviation officer is responsible for the planning and reconnoitering of the division airfield and the establishment of navigational facilities located in conjunction with the airfield.

c. General factors determining selection of airfield and navigational sites include proximity to troops and supplies, slope, prevailing wind, altitude, cover and concealment, dispersal space, axis of communications, drainage, defilade, and soil texture.

d. To assist in planning and reconnoitering of airfields and heliports the criteria listed in TAB A (Design Criteria for Army Airfields and Heliports, Pioneer Type) (Omitted) is established.

3. AIRFIELDS

Expedients may be used for lighting and communications equipment if issue equipment is not available or is inoperative. See TAB B (Marking and Lighting for Airfields) for authorized expedients.

4. HELIPORTS

All brigades and major separate units will establish a primary heliport which will be located within the vicinity of the unit command post(s) in accordance with these instructions:

a. Heliports will be operated on a twenty-four hour basis.

b. Helicopters will not fly over CP sites.

c. Heliports will be marked by the use of pierced steel planks (PSP). The PSP will be utilized as both an identification marker, a wind "T", and a touchdown point for helicopters.

(1) See TAB C (Marking and Lighting of Heliports).

(2) See current SOI for heliport ID markings.

d. PSP will be continuously oriented with respect to the existing wind conditions and the locations, size, etc., of the particular site.

e. Helicopters desiring to land at heliports will circle the heliport area and flash landing light.

f. Ground crew personnel operating heliports will display color side of PSP whenever aircraft is circling for an approach.

g. The night lighting system utilized will be operationally ready from sunset to sunrise.

h. Expedients may be used for lighting and communications equipment if issue equipment is not available or is inoperative.

TAB A. Design criteria for Army airfields and heliports, pioneer type.

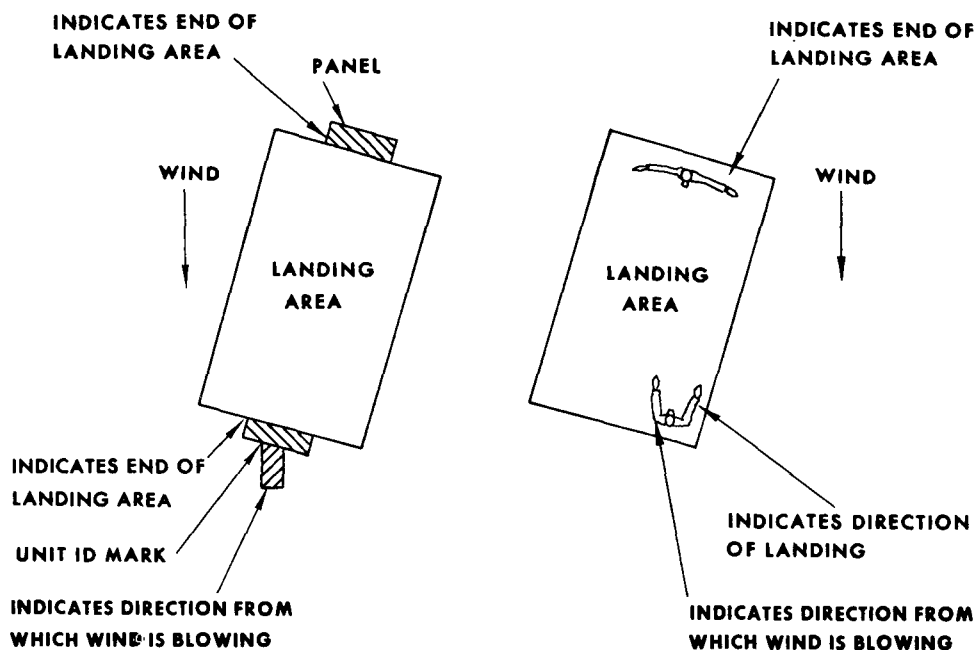
(Omitted.)

TAB B. Marking and lighting of airfields.

TAB C. Marking and lighting of heliports.

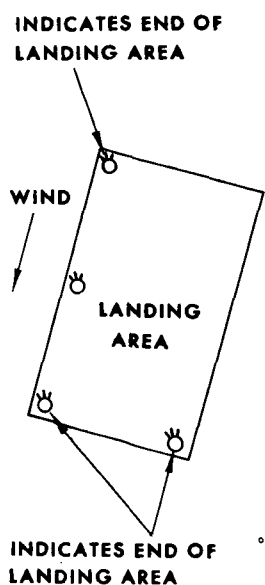
TAB A. Design criteria for Army airfields and heliports, pioneer type.

DAYLIGHT OPERATIONS

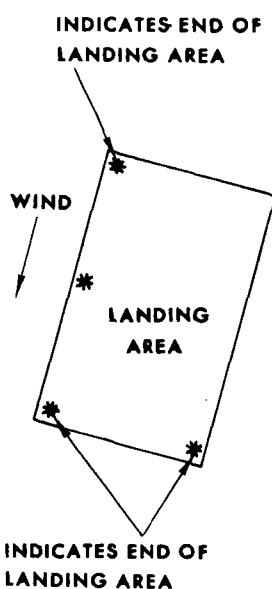


NIGHT OPERATIONS

SMOKE POTS OR LANTERNS



FLASHLIGHT POINTED TO GROUND



VEHICLE LIGHTS

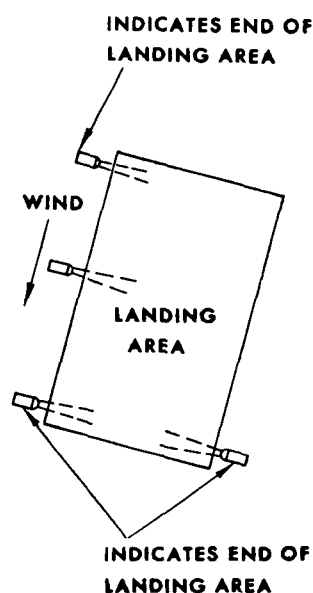
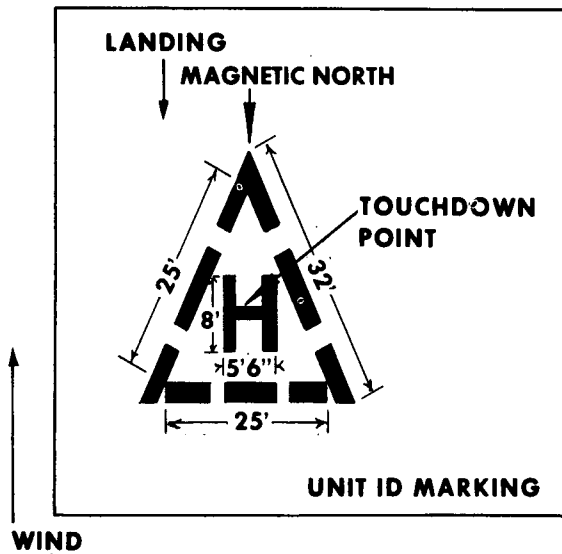


Figure 25. Marking and lighting of airfields.

TAB B. Marking and lighting of airfields.

DAYLIGHT OPERATIONS



NIGHT OPERATIONS

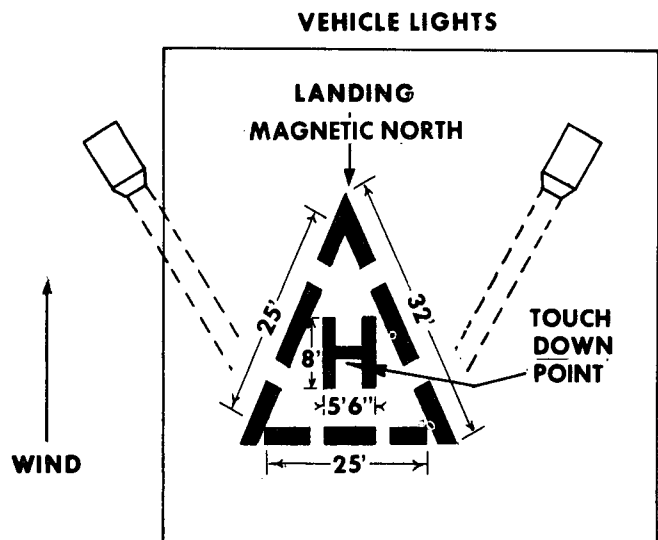
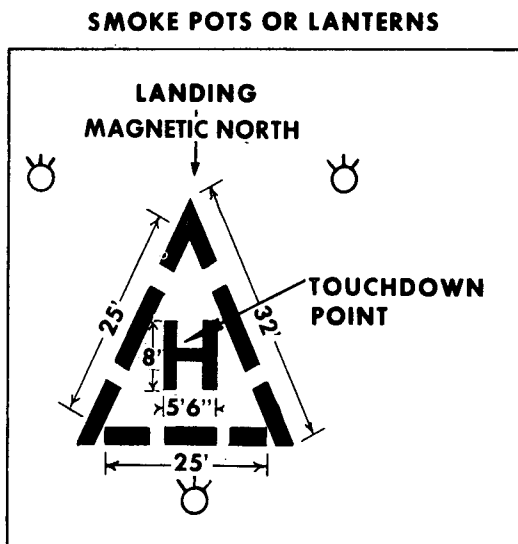


Figure 26. Marking and lighting of heliports.

TAB C. Marking and lighting of heliports.

APPENDIX 3 (SEARCH AND RESCUE OPERATIONS) TO ANNEX E

1. The responsibility for search and rescue operations within the division rests with the division aviation officer.
2. All units and personnel under the jurisdiction of division will be prepared to provide support for search and rescue missions.
3. Missions, once assigned, may be closed only on authority of Hq, 21st Infantry Division.
4. Before initiating search and rescue operations, the commander concerned must be consulted for the general effect such a mission will have on the overall mission of the unit. The G2(S2) must be queried for information concerning enemy air and air defense capabilities. G3(S3) must be kept informed of missions so that tactical plans, scheme of maneuver, fire support, etc., may be properly coordinated.
5. Division G3, based upon recommendations of the division aviation officer, will determine the priorities for search and rescue missions.
6. All missions, except those requiring immediate search and rescue action, will be controlled by the division aviation officer. The division aviation officer will coordinate search and rescue missions within the division area. An aviation officer of a subordinate unit may be designated mission coordinator for a specific mission.
7. Based upon information received, the aviation officer of the unit directed to perform a rescue operation will take immediate action to—
 - a. Dispatch observation aircraft to the rescue area to aid in the location of the object of rescue.
 - b. Coordinate through G3 (S3) with fire support elements to place protective fires where required to isolate the individual(s) from the enemy.
 - c. Coordinate through G3(S3) with the fire support center to obtain necessary air protection and air defense artillery support.
 - d. Alert personnel to ready necessary aircraft and equipment to perform the rescue.
 - e. Perform necessary briefing of rescue personnel.
 - f. Alert medical personnel to accompany the rescue mission with necessary medical equipment.
8. Unit commanders having Army aircraft within their command will be prepared to release to the mission coordinator such aircraft as may be required for the accomplishment of the mission.
9. Search and rescue operations will be coordinated with SCC or AATCC, when applicable.
10. Conduct of search and rescue, to include detailed search patterns and methods, is covered in chapter 10, FM 1-100.

APPENDIX V

SAMPLE REQUEST FOR FLARES

This sample request for flares is divided into two sections: section I to be used by the requesting unit, and section II to be used by the action officer. (Normally, when Army aircraft are used for flare employment, the Army aviation element within the tactical operations center will be the action agency.) This sample can be sent by messenger or it can be used as a guide when transmitting information by radio/telephone.

SECTION I.

1. Date, duration, and time of allumination -----
(Specific times and duration, such as "3 minutes at 2150, 2240, 2310," "1 hour 30 minutes continuous after 0145." "30 minutes on call.")
2. Location of area or point to be illuminated -----
(This can be done by coordinates, overlay, or marked map of area or point.)
3. Purpose -----
(This includes the manner in which the ground force intends to employ illumination as well as its need for the illumination.)
4. Proposed means of control -----
(This may be by ground observer, radar, or other navigational techniques and should include radio call signs and frequencies to establish and maintain contact to achieve control.)
5. Requesting unit -----
(Unit designation of requesting unit.)
6. Remarks -----
(Any other information requesting unit deems necessary.)

SECTION II.

1. G3 approval and allocation -----
(If approved, give no. of aircraft allocated.)
2. Mission no. -----
3. Coordinated with
 - a. Air defense -----
 - b. Adjacent units -----
 - c. G2 -----
 - d. Others -----
(Give statement of coordination accomplished; e.g., air defense: time of flight and routes coordinated.)
4. Aviation unit mission assigned to -----

APPENDIX VI

HELICOPTER NIGHT-LANDING SYSTEM (FIELD EXPEDIENT)

1. General

This field expedient helicopter night-landing system supplies the need for a lightweight, portable, economical device to aid helicopters landing during darkness. This lighting expedient is suitable for landing areas where a heavy system would be unwieldy and impracticable. It controls lateral as well as vertical position, offers a high angle of descent, and is adaptable to small areas.

2. Materials Required

The materials required to construct this lighting expedient are normally available within the aviation unit.

a. Four standard flashlights (three equipped with red lens and one with a green lens) will provide the necessary illumination.

b. Four sturdy stakes are required: three to extend 21 inches above the ground and one to extend 6 feet above the ground. Each stake has a block, notched to hold a flashlight, attached approximately 6 inches from the top. By slanting this block up slightly, the range of the light beam up the glide path is increased.

3. Construction

Construction of this lighting expedient is simple and can be accomplished by one man in a few hours.

a. First, drive the three shorter stakes into the ground approximately 50 feet upwind from the desired landing point, aligning them perpendicular to the direction of landing. If no H-13's or H-23's will be using the lighting arrangement, a greater distance from the landing point is preferable. When using this light-

ing arrangement, an aviator operates by what he sees and the position from where he sees it. The larger helicopters place the aviator further from the ground; therefore, they will appear slightly farther away from the lights when the helicopters first establish ground contact (fig. 27).

b. Next, drive the longer stake into the ground 20 feet from, and perpendicular to, the row of smaller stakes.

c. Place the flashlights on their proper stakes. The flashlights having the red lens are attached to the shorter stakes; the one having the green lens is attached to the 6-foot stake. The flashlights should not be permanently attached to the stakes as they may be damaged when driving the stakes into the ground.

4. Application

a. This helicopter night-lighting expedient offers the aviator continuous information as to his helicopter's position with relation to the glide path. This is revealed by the "sight picture" or the position of the green light in relation to the center red light. When a helicopter is in the correct approach position, both vertically and laterally, the green light will block out the view of the center red light. The outer red lights will still be visible and will aid in continuing the proper descent. Figure 28 illustrates sight pictures from different approach positions.

b. The rule for making flight corrections is to correct to the green light. If the green light is below the center red light, the flight correction should be downward; if the green light is to the right of the center red light, the flight correction should be to the right.

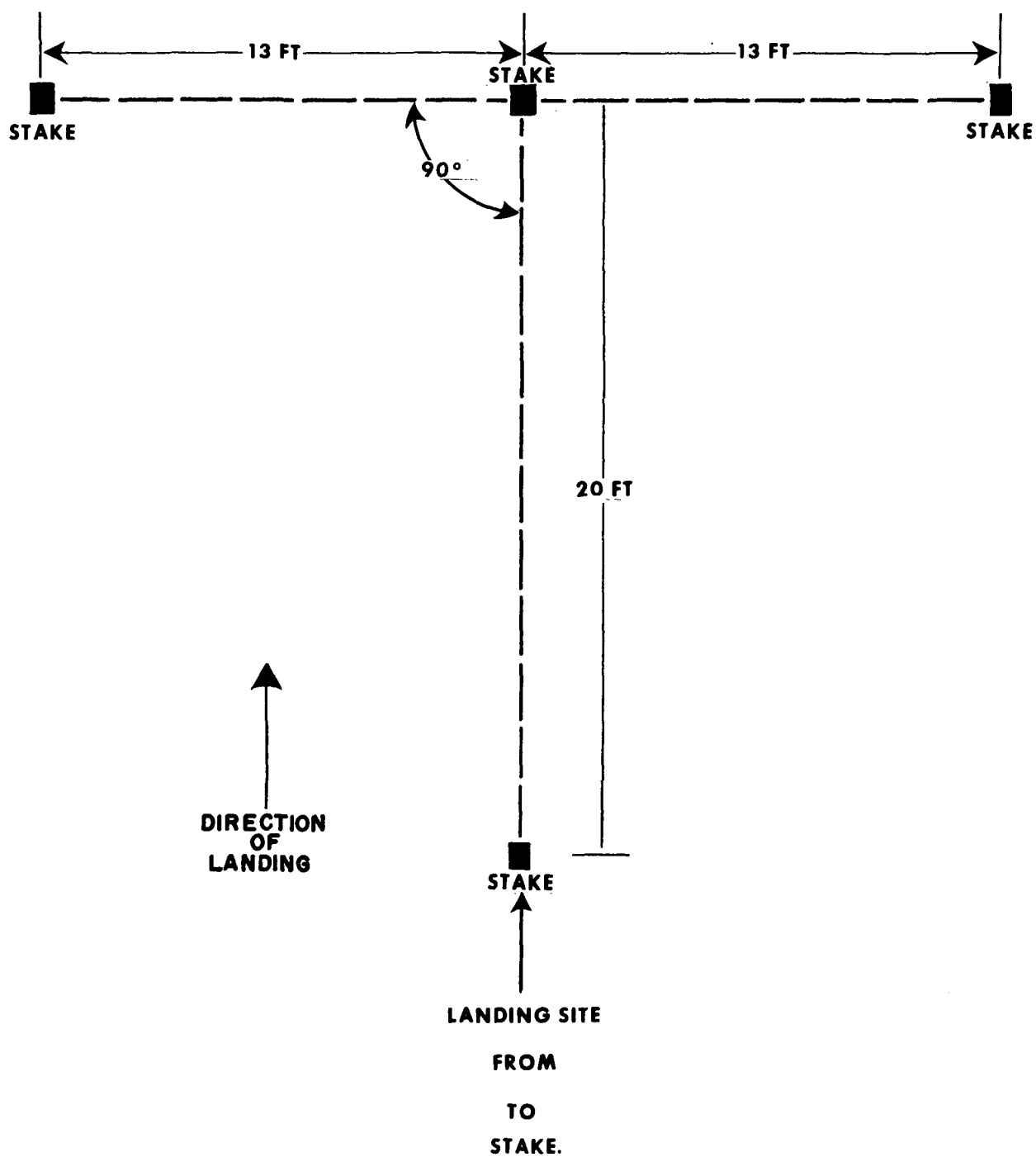
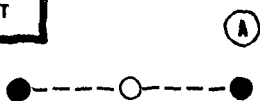


Figure 27. Layout of helicopter night-landing system (field expedient).

NOTE:

- RED LIGHT
- GREEN LIGHT

CORRECT PICTURE



(SIDE VIEW)

LINE OF SIGHT



(TOP VIEW)



(B)

PICTURE WHEN AIRCRAFT IS LOW BUT ON CENTER



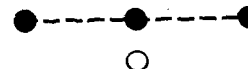
(SIDE VIEW)

LINE OF SIGHT



(C)

PICTURE WHEN AIRCRAFT IS HIGH BUT ON CENTER



(SIDE VIEW)

LINE OF SIGHT



(D)

PICTURE WHEN AIRCRAFT IS LEFT OF CENTER



(TOP VIEW)

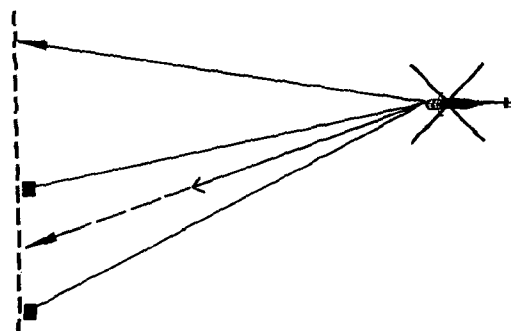


Figure 28. Sight pictures.

APPENDIX VII

AIRCRAFT ACCIDENT INVESTIGATION KIT

1. General

An aircraft accident investigation kit, which must be available to aircraft accident investigators, will contain various items according to climatic and terrain conditions. Although most of the items will be available through normal supply channels, some may have to be improvised.

2. Items

Suggested items for inclusion are—

- a.* Suitable clothing.
- b.* First aid kit, to include snakebit kit in areas where poisonous reptiles are prevalent.
- c.* Magnetic compass.
- d.* Steel measuring tape (50–100 feet).
- e.* Protractor with scale.
- f.* Maps and/or charts.
- g.* Clip board and notebook.
- h.* Clean containers for fuel, oil, and other material samples.
- i.* Shipping tags.
- j.* Flashlight with spare parts.
- k.* Suitable handtools, including knife.
- l.* Chalk, grease pencils, and ladies' nail polish.
- m.* Heavy twine.
- n.* Magnifying glass (5 power or greater).
- o.* Appropriate airframe and engine publications and operating handbooks.
- p.* Models of various types of aircraft (painted and marked in the same manner as the aircraft they represent).
- q.* DA Forms for accident reporting.

APPENDIX VIII

PREACCIDENT PLAN (MODEL)

This sample preaccident plan is for illustrative purposes only. The preaccident plan will normally be published as a circular at the post to which aviation is assigned when in garrison; in the field it will be a part of the unit SOP. The plan is designed to facilitate air crash rescue, fire-fighting, and accident investigation

HEADQUARTERS
POST, CAMP, STATION, OR UNIT

----- (Date)

PREACCIDENT PLAN

1. Purpose: To establish responsibilities and procedures which will insure the efficient handling of in-flight emergencies and crash-rescue operations, and provide the basis for a full objective aircraft accident investigation.

2. Scope: This plan sets forth basic preparatory measures, duties of personnel, and operational procedures essential to activating crash-rescue services and crash-firefighting equipment, with "saving lives" foremost in mind. It further encompasses the duties and responsibilities of certain supporting activities within the command and prescribes preliminary procedures to be followed in the investigation of aircraft accidents.

3. Responsibilities: The Staff Aviation Officer is responsible to the Commanding General for administration of this directive. Annexes A through Q outline the duties and responsibilities of the following personnel concerned:

- a. Tower Personnel.
- b. Airfield Crash Firefighting and Ambulance Crews.
- c. Airfield Operations Personnel.
- d. Surgeon.
- e. Aircraft Maintenance Officer.
- f. Fire Marshal.
- g. Provost Marshal.
- h. Aircraft Accident Investigation Board.
- i. Transportation Officer.
- j. Signal Officer.
- k. Staff Aviation Officer.
- l. Adjutant.
- m. Public Information Officer.
- n. Safety Officer.

o. Quartermaster Officer.

p. Chaplain.

4. Communications: A radio crash net and a crash alarm system will be established and will consist of the following:

a. Crash Net: This will consist of crash ambulances, telephones, tower, standby aircraft, and rescue vehicles.

b. Crash Alarm System: There are two components of the crash alarm system—the primary intercom alarm circuit and secondary alarm circuit.

(1) The primary intercom alarm circuit is used to notify those personnel who must depart immediately for the accident scene. It is also used to notify the operations dispatcher so that he, in turn, can notify all other personnel concerned. Stations in the primary alarm circuit are—

- (a) Control tower.
- (b) Crash fire and ambulance stations.
- (c) Operations dispatcher.

(2) The secondary alarm circuit may operate through the regular telephone switchboard with the command instrument at the operations dispatcher's desk. Stations in the secondary circuit, in the order to be called, are—

- (a) Stations on the primary alarm circuit (for confirmation).
- (b) Surgeon.
- (c) Aircraft Maintenance Officer.
- (d) Fire Marshal.
- (e) Provost Marshal.
- (f) Aircraft Accident Investigation Board.
- (g) Transportation Officer.
- (h) Signal Officer.
- (i) Staff Aviation Officer.
- (j) Adjutant. The Adjutant, in turn, notifies the following:
 - 1. Commanding General.
 - 2. Staff Officer as required.
 - 3. Chaplain.
 - 4. Public Information Officer.
 - 5. Safety Officer.
 - 6. Other agencies whose presence at an aircraft accident is determined to be necessary by the Commanding General.

5. In-flight Emergencies: Upon receiving notification of an in-flight emergency, the tower personnel will notify all stations on the primary alarm circuit. The airfield operations section dispatcher will, in turn, alert the following by telephone on the secondary circuit:

- a. Stations on primary alarm circuit (for confirmation).
- b. Surgeon.
- c. Aircraft Maintenance Officer.
- d. Staff Aviation Officer.

6. General: To insure effective implementation of this plan, the following general procedures will apply:

a. This plan establishes the basic responsibilities and the procedures to be followed if an aircraft accident or emergency occurs within a reasonable distance from the airfield.

b. Personnel and activities having responsibilities listed in attached annexes will prepare and keep current a detailed plan for carrying out their assigned duties. The Staff Aviation Officer will be furnished a copy of each plan and changes thereto.

c. Upon notification of an aircraft accident, investigating and supporting personnel will assemble at Airfield Operations from where they will proceed to the scene of the accident in an organized manner. They will be equipped with the necessary clothing and equipment to adequately perform their prescribed duties.

d. Support personnel, when needed, will become nonvoting members of the Aircraft Accident Investigation Board and will assist as prescribed by the president of the board.

e. The president of the Aircraft Accident Investigation Board will assume command of the accident scene after release of the aircraft by firefighting and crash-rescue personnel. Copy of the order appointing the Aircraft Accident Investigation Board is attached as Annex Q.

FOR THE COMMANDER:

OFFICIAL

JOHN C. DOE
Colonel, GS
Chief of Staff

RICHARD G. ROE
Lt Colonel, AGC
Adjutant General

DISTRIBUTION
A, B, C

Annex A (Duties and Responsibilities of Tower Personnel) to the Pre-accident Plan.

1. This annex outlines the duties and responsibilities of the Tower Personnel.

2. Tower Personnel are responsible for—

a. Activating the primary alarm system and conveying exact information as to the location of the accident or expected location of the impending emergency.

b. Notifying all traffic on the airfield and in the air of the crash, or emergency, and for closing the airfield to traffic until runways are available for normal operations.

c. Posting a current crash grid map in a prominent position in the tower.

d. Assuring that all operating personnel are thoroughly familiar with the current crash grid map.

e. Insuring that all personnel are familiar with the procedures for implementing the crash alarm system and the procedures for in-flight emergencies.

Annex B (Duties and Responsibilities of Crash Firefighting and Ambulance Crews) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Air Crash Firefighting and Ambulance Crews.

2. Crash Firefighting and Ambulance Crews have the following responsibilities:

a. Crash trucks and ambulances will immediately respond to the crash or emergency. In the event of an emergency landing, drivers will align crash trucks and ambulances near the runway to facilitate prompt action.

b. If the crashed aircraft catches fire, medical personnel will stand by at a safe distance from the burning aircraft. Crash-rescue personnel will remove injured personnel from the aircraft.

c. If the crashed aircraft does not catch fire, and after thorough fire-hazard precautions have been taken by the crash chief, the medical officer or his representative will direct removal of the injured.

d. When available, at least one ambulance will stand by at the scene of the accident until the aircraft fire is totally extinguished or precautions against fire hazards are completed.

e. The medical officer will be responsible for identifying aircraft crash victims in accordance with current criteria on this subject. All available portions of human tissue will be collected from the area surrounding the crash.

Annex C (Duties and Responsibilities of Airfield Operations Personnel)
to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of Airfield Operations Personnel.
2. Upon notification of an in-flight emergency, the Airfield Operations Officer is responsible for notifying the following personnel, using the secondary circuit:
 - a. Stations on the primary alarm circuit (for confirmation).
 - b. Surgeon.
 - c. Aircraft Maintenance Officer.
 - d. Staff Aviation Officer.
3. Upon notification of an aircraft crash, the Airfield Operations Officer is responsible for notifying the following personnel in the order listed, using the secondary circuit:
 - a. Stations on the primary alarm circuit (for confirmation).
 - b. Surgeon.
 - c. Aircraft Maintenance Officer.
 - d. Fire Marshal.
 - e. Provost Marshal.
 - f. Aircraft Accident Investigation Board.
 - g. Transportation Officer.
 - h. Signal Officer.
 - i. Staff Aviation Officer.
 - j. Adjutant.
4. The Airfield Operations Officer will prepare a grid map (1:2500 size) to encompass a circular area of not less than 15 miles radius from the airfield. He will provide a copy to all stations on the primary crash alarm system. He will also maintain a grid map, supply revised copies to all stations when revisions are required. The grid maps will be kept "up-to-date" at all times, and will emphasize locations of prominent terrain features, roads, churches, schools, etc., as checkpoints.
5. The Airfield Operations Officer is also responsible for—
 - a. Establishing the crash alarm system in accordance with SR 95-50-1, as supplemented by paragraph 4, this plan.
 - b. Establishing and controlling an adequate crash personnel pass system.
 - c. Maintaining a current list of all personnel to be notified and procedures for notifying them on or off duty.
 - d. Indoctrinating dispatch personnel in crash-alarm procedures.
 - e. Monitoring the training of aircraft crash-rescue crews.
 - f. Establishing procedures to coordinate the movement of all necessary personnel and equipment to the scene of the accident. (Coordinate with the Transportation Officer as to the number and types of vehicles needed.)
 - g. Furnishing Army aviators for the two standby aircraft and dispatching them as needed.
 - h. Obtaining a special weather observation upon notification of an aircraft accident.

Annex D (Duties and Responsibilities of the Surgeon) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Surgeon.
2. The Surgeon will be responsible for—
 - a. Furnishing an adequate number of trained personnel for standby at the crash-fire station.
 - b. Furnishing an ambulance equipped with necessary medical aids for standby at the crash-fire station.
 - c. Insuring that a current crash grid map is available in each ambulance and that all medical personnel are thoroughly familiar with the most expeditious routes to all points covered.
 - d. Insuring that all medical personnel assigned aircraft accident duty are thoroughly trained in emergency medical treatment procedures.
 - e. Insuring that a medical officer is available to proceed to the scene of an aircraft accident.
3. In the event of an in-flight emergency, the Surgeon will alert the necessary hospital personnel and direct the completion of the necessary arrangements for receiving the injured.

Annex E (Duties and Responsibilities of the Aircraft Maintenance Officer) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Aircraft Maintenance Officer.

2. The Aircraft Maintenance Officer will be responsible for—

a. Having adequate equipment and personnel on standby for dispatch to the scene of the accident, when needed.

b. Insuring that adequately trained personnel are available at all times to assist in moving the wreckage for the release of injured or deceased personnel.

c. Providing personnel and facilities for removing, inspecting, disassembling, packing, and shipping of parts removed from the aircraft accident scene for further investigation.

d. Indoctrinating salvage personnel in the importance of and necessity for preserving the wreckage.

e. Providing personnel and equipment to remove wreckage upon release.

f. Preparing Equipment Improvement Recommendation, DA Form 2407, as necessary, in connection with accident causes.

g. Providing Airfield Operations with one L-19 and one utility helicopter daily.

h. Providing technical assistance as required by aircraft investigation boards.

i. Securing and screening all maintenance records, reports, and technical publications pertaining to the aircraft involved.

Annex F (Duties and Responsibilities of the Fire Marshal) to the Pre-accident Plan.

1. This annex outlines the duties and responsibilities of the Fire Marshal.

2. The Fire Marshal will be responsible for—

a. Providing adequate personnel and crash firefighting equipment in compliance with the provisions of SR 95-50-1.

b. Training personnel in operation of aircraft emergency access doors and hatches, marking of emergency cutting areas, and in location of batteries and fuel tanks.

c. Insuring that Standing Operating Procedures include firefighting techniques and location of equipment.

d. Assuming control when a fire occurs as a result of an aircraft crash, until such time as he declares the area safe for proceeding with the investigation. In the absence of the Fire Marshal, or his assistant, the Fire Chief will represent the Fire Marshal.

e. Establishing and maintaining liaison with local civil fire protection officials to insure off-post aircraft crash fire coverage.

f. Insuring that military and civilian firefighting personnel who may be called upon to fight crash fires are thoroughly indoctrinated in the necessity for the preservation of the wreckage, and insuring that the wreckage will not be disturbed except for the removal of trapped personnel.

Annex G (Duties and Responsibilities of the Provost Marshal) to the Pre-accident Plan.

1. This annex outlines the duties and responsibilities of the Provost Marshal.
2. The Provost Marshal will be responsible for insuring that—
 - a. Standing Operating Procedures include instructions for personnel to proceed to the crash scene to guard the area and to man traffic control posts.
 - b. Transportation is available to transport guards to the accident.
 - c. Guards are briefed on the necessity of keeping unauthorized personnel away from the scene of the accident.
 - d. Guards are thoroughly instructed on the importance of securing the wreckage and making sure it is not disturbed, except for the removal of the injured and deceased.
 - e. The wreckage is guarded until relieved by the president of the Aircraft Accident Investigation Board or the Accident Investigating Officer.

Annex H (Duties and Responsibilities of the Aircraft Accident Investigation Board) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Aircraft Accident Investigation Board.
2. The Aircraft Accident Investigation Board is responsible for—
 - a. Being familiar with the provisions of this plan, applicable regulations, and procedures to be followed during the investigation of aircraft accidents.
 - b. Immediately proceeding to Airfield Operations for coordinated movement to the accident scene.
 - c. Supplying the Commanding Officer with the necessary information to accomplish the crash and preliminary reports.
3. The president of the Aircraft Accident Investigation Board will—
 - a. Assume command of the accident scene after release of aircraft by crash-rescue chief.
 - b. Release the wreckage to the reclamation crews for removal from the scene of the accident.
 - c. Brief all members of the board on available information and assign duties individually for organized, systematic collection of data.

Annex I (Duties and Responsibilities of the Transportation Officer) to
the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Transportation Officer.

2. The Transportation Officer will be responsible for—

a. Dispatching adequate transportation to Airfield Operations for transporting the Aircraft Accident Investigation Board and supporting personnel to the scene of the accident. (Number and type of vehicles to be established by Operations Officer.)

b. Insuring that drivers report to Operations Officer for further instructions.

Annex J (Duties and Responsibilities of the Signal Officer) to the Pre-accident Plan.

1. This annex outlines the duties and responsibilities of the Signal Officer.
2. The Signal Officer will be responsible for—
 - a. Insuring that a photographer is on call 24 hours a day.
 - b. Dispatching a photographer to Airfield Operations with instructions to report to the Aircraft Accident Investigating Officer.
 - c. Insuring that adequate equipment is available for day or night photography and that the photographer is thoroughly familiar with and knows how to use this equipment.
 - d. Providing communications facilities necessary for proper implementation of this plan.

Annex K (Duties and Responsibilities of Staff Aviation Officer) to the
Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Staff Aviation Officer.

2. The Staff Aviation Officer is responsible for—

a. Insuring that the provisions of this plan are kept current and that all personnel concerned are thoroughly familiar with their duties.

b. Maintaining a constant state of readiness.

c. Conducting periodic practice tests to insure that the operating procedures established by this plan are applicable at any time of the day or night.

d. Preparing and dispatching crash and followup reports of aircraft accidents.

Annex L (Duties and Responsibilities of the Adjutant) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Adjutant.
2. The Adjutant is responsible for—
 - a. Immediately notifying the following personnel of the accident and furnishing information necessary to implement this plan:
 - (1) Commanding General.
 - (2) Chaplain.
 - (3) Public Information Officer.
 - (4) Safety Officer.
 - (5) Claims Officer, if required.
 - (6) Other agencies whose presence at an aircraft accident is determined to be necessary by the Commanding General.
 - b. Designating the Staff Duty Officer as the person to perform, during nonduty hours, those duties normally assigned the Adjutant.

**Annex M (Duties and Responsibilities of the Public Information Officer)
to the Preaccident Plan.**

- 1. This annex outlines the duties and responsibilities of the Public Information Officer.**
- 2. The Public Information Officer is responsible for—**
 - a. Reporting to Airfield Operations for coordinated movement to the crash scene.**
 - b. Preparing news releases in accordance with applicable regulations.**
 - c. Promptly releasing information necessary to dispel rumors.**
 - d. Preparing applicable releases for later date.**

Annex N (Duties and Responsibilities of the Major Headquarters Safety Officer) to the Preaccident Plan.

1. This annex outlines the duties and responsibilities of the Safety Officer.
2. The Safety Officer will maintain close liaison with the Staff Aviation Officer, rendering flight safety assistance whenever possible.
3. The Safety Officer will make available to the investigation board all pertinent and current directives relative to accident investigation and reporting.

Annex O (Duties and Responsibilities of the Quartermaster Officer) to the Preaccident Plan.

- 1. This annex outlines the duties and responsibilities of the Quartermaster Officer.**
- 2. The Quartermaster Officer will sample fuel for contamination in all accidents in which there is an indication or suspicion that engine failure or power loss contributed in any degree to the cause of the crash.**

Annex P (Duties and Responsibilities of the Chaplain) to the Preaccident Plan.

- 1. This annex outlines the duties and responsibilities of the Chaplain.**
- 2. The Chaplain will assist with personal matters in cases of death or injury.**

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By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DCSPER (2)
ACSI (2)
DCSLOG (10)
DCSOPS (10)
Ofc Res Comp (2)
CRD (5)
COA (1)

CINFO (1)
TIG (1)
TJAG (1)
TPMG (1)
TSG (3)
CofEngrs (1)
CofCh (1)

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USCONARC (10)	11-117
ARADCOM (10)	11-500 (UA, UB)
ARADCOM Rgn (5)	17-2 (5)
USACACDA (5)	17-4 (5)
USA Maint Bd (5)	17-22 (5)
LOGCOMD (5)	17-26
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EUSA (100)	17-78 (5)
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USACGS (2200)	30-6
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Br Svc Sch (5) except	30-17
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NG: State AG (3); units—same as active Army except allowance is one copy to each unit.

USAR: Same as active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320-50.